ADVANCE MICROECONOMIC THEORY

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SYLLABUS

Advance Microeconomics Theory

Objectives

- The objective of this course is to acquaint students with the basic structure of Microeconomic Theory. The course will enable students to analyse problems in the key areas using appropriate tools. This will equip the students to take managerial decision in context of microeconomic developments.

S.No.	Topics
1.	Bain's Limit Pricing Theory
	Marginalism and Average Cost Pricing Theory
2.	Baumol's Sales Maximization Hypothesis
	Distribution: Classical Theories: Ricardo, Marxian
	Macro Theories: Ricardian, Marxian, Kalecki's Theories
	Welfare Economics: Pareto Optimality Conditions in Production, Consumption and Exchange
	Market Failure due to Externalities in Production
3.	Pigou's Solution to Taxes and Services
	Social Welfare Function
4.	**General Equilibrium:** Partial and General Equilibrium Approaches
	Production without Consumption
5.	**Economics of Uncertainty:** Choice in Uncertain Situations
	Insurance Choice and Risk
	Economics of Information

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Unit-1: Bain's Limit Pricing Theory

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Introduction

1.1 Limit Price Theory of Bain

1.2 Its Criticisms

1.3 Summary

1.4 Keywords

1.5 Review Questions

1.6 Further Readings

Objectives

After studying this unit, students will be able to:

- Know Limit Price Theory.
- Understand Bain's Model.
- Know Product Differentiation.

Introduction

V.S. Bain is the first economist who proposed Limit Price Determination Theory in one of his articles. Then he revised this theory in his first book *Barriers to New Competition* in 1956 and in 1959 in his second book *Industrial Organization*. He represented that collusion firms can be afraid of probable entrance of other firms. They cannot have substitutes of their commodities in definite range. But if price is fixed at high level, then probably opposite firms are afraid of entrance. They can enter in industry on attracting high profits. In this condition, the price is always high which is called Price Limit. Established firms can charge this price without attracting entrance of other firms.

In his *Barriers to New Competition*, **Bain** has developed limit price determination theory for stopping the entrance of new firms by giving more elaborated certified statement. In his book *Industrial Organization*, he has given better statement of his theory. We are mentioning the **Bain's** Theory which has been described in his books.

1.1 Limit Price Theory of Bain

Bain has developed Limit Price Determination Theory to stop the entrance of new firms in a short authorized industry in his book *Barriers to New Competition* (1959). Joining with collusion, limit price is fixed by a group of firms, which is the highest general price. It is the price which can prevent the

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entry of other firms in the established firm industry without motivating it. This price can be less than the profit maximum price in short duration and will depend on relative cost of firms of inside and outside the group and demand conditions in industry. **Bain** tells the limit price is upper maximum price than the competitor price, which is fixed by established firms. These price works as the barrier of entrance of new firms. The profits obtained by upper established firms of new entrants in the industry are the barriers of entrance.

Self Assessment

Fill in the blanks:

1. ..... are done for price and production in long-term.
2. ..... are established least right in industry.
3. Other firms in group follow ..... price policy.
4. ..... is effective in established firms.

Its Assumptions

Bain's Model depends on following assumptions—

1. Adjustments are done for price and production in long-term.
2. Least Right firms are established in the industry.
3. Demand curve for production of industry is not affected by the entrance of new firms or price adjustments by least right firms.
4. Collusion is potential among established firms. This trick pact depends on chief leader.
5. Other firms follow unification price policy in group.
6. Lead firm fixes limit price or entry barrier price, under which entry cannot be done.
7. There is only one probable entrant firm whose investments are less in comparison to other probable entrants.

Notes Joining with collusion, limit price is fixed by a group of firms, which is the highest general price.

Bain Model

Bain initiates his limit price determination model by the conditions of entrance. It is premium or per cents by which established firms can raise price than the competitor price without attracting the entrance of new firms in group.

Symbolically, condition of entrance,

$$E = \frac{P_L - P_C}{P_C} \text{ and } P_L = P_C (1 + E)$$

Where P_L is limit price and P_C is competitor price. Formula shows that E is the premium which established firms obtain limit price (P_L) without attracting the entrance of new firms. When established firms fix P_L above P_C, they earn more than general profit because competitor price is P_C = LAC in which general profit is also included. Therefore, E is the end limit above competitor price, P_C (or premium), which established firms earn fixing the high limit price (P_L).

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According to **Bain**, time duration included in situation of entrance is long in which a special range of changed condition of demand, procedure prices etc. is merged. This time duration can be of range of 5-10 years. More the time taken by a firm to establish, less will be the fear of entrance. Therefore, the gap between limit price (P_L) and competitor price (P_C) will be more. This gap is known as **Entry Gap** or **Entry Barrier.**

To understand basic relation between entry barriers and limit price determination, analysis of **Bain has** distributed between Sources of Entry Barriers and Determination of Limit Prices.

Sources of Entry Barriers and Determination of Limit Prices

Bain mentions four main sources of entry barriers: Product Differentiation, Economies of Scale, Absolute Cost Advantages and more amount of money. **Bain** includes more amount of money in absolute cost advantages in his book *Industrial Organization*. So we are also not mentioning it differently.

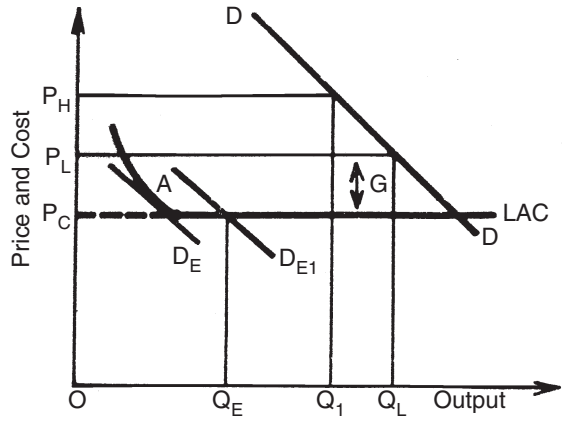
Product Differentiation

Product differentiation gives the following ways of an entry barrier of a new firm:

1. Preferences for commodities of established firms.
2. Entrant firm needs to compete with established firms by advertising and big investment, which is far away from the economic budget of new firm.
3. There should be famous brand for established firms. In this way it can be difficult for new firm to compete with brand loyalty of customers.
4. If established firms have special sale ways to sale their commodities and have only one purchase agreement with wholesale buyers, then will face problems in establishing themselves in the new entrant firm market.

Limit Price Determination— Product differentiation as the entry barrier is explained in Fig. 1.1. Let the average costs be constant, the cost curve of LAC established firm is long-term average cost curve. The demand curve of group or the one which **Bain** called the best firm is DD. P_L is limit price fixed by this firm and Q_L is limit production. If firm takes P_L price then demand curve of possible entrant firm is D_E which does not allow it enter in least right market because D_E curve touches LAC on A point. That's why there is not any production level of firm which is more than the average production cost. If established firm raise the price to P_H which is entry inducing price so the production will fall to Q_1.

Fig. 1.1



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This inspired possible entrant firm to enter in the market and its demand curve rises to DE_1. New firm Q_E can produce quantity of any commodity at level. That amount of P_L price which is more than the P_C is the "height" of entry gap or entry barrier, which is denoted by G in the figure.

Self Assessment

Multiple choice questions:

5. **Bain** does his Limit Price Determination Model by the condition of entrance–
   (a) initiate (b) finish
   (c) interactions (d) none of these
6. According to **Bain**, the time duration included in entry situation is-
   (a) Short (b) Long
   (c) Zero (d) None of these
7. There is only one possible entrant firm, which has its costs in comparison to other possible entrants-
   (a) more (b) general
   (c) less (d) none of these
8. **Bain** mentions …….. main sources of Entry Barriers.
   (a) two (b) three
   (c) five (d) four

Economies of Scale

Economies of scale are obtained by indivisibilities and specification in production and management and advantages from division of labour. R and D also affect marketing and distribution. Factors of economies of sales at level of limit price depend on the (a) expectations of entrant firm about reactions of established firm after the entry of possible entrant firm; and (b) expectations of established firms about the behaviour of entering firms.

Bain describes six possible expectations of possible entrant firms: (1) It expects from established firm that they keep the price constant after entry level. (2) It expects from established firms that they keep the production constant after entry level. (3) It expects from established firm that they let partly decrease their production and decrease their price but less than the above two possibilities. (4) It expects changes by the established firms so that they increase their before entry production. (5) It expects from the established firms that they decrease their production so that price raises higher than before entry level. (6) It expects the entry in industry without observing from any established firm because its plant is of very short scale so that established firms neither change their production nor change their market price.

From the above mentioned six possible expectations by possible entrant firm, **Bain** means third one most actual and possible. It is because entrant firm expects from established firm that they will partly decrease their production and will let partly fall the price. We will describe only two possible conditions.

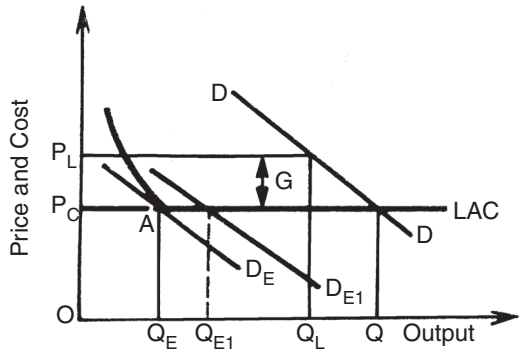
Did u know? **Bain** initiates his limit price determination model with the conditions of entrance

Notes

1. Price Constant

In this condition, entrant firm expects constant price after entry level. Established firms permit entrant firms to fix the price of the quantity of commodity on given demand curve and plant scale of this firm. As a result, less will be the parts in total production of established firms.

Fig. 1.2

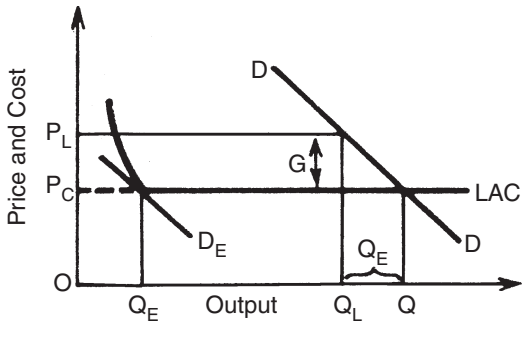


In this Fig. 1.2, it is shown that where DD is the demand curve of established firms which produce maximum production Q on scale of plants and sell it on competitor price. If established firms limit (entry barriers) price P_L then limit production is Q_L. They will sell QQ_1 less quantity of production than the production on maximum scale of plant. This price will stop possible entrant firm to enter in the market when it is producing Q_E on minimum scale of plant. Demand curve of every firm is D_E which is parallel to market demand curve. This D_E curve touches on LAC curve point, so that level of any production of this firm is not more than the average cost. The gap G scale curve between P_L and P_C is its entry gap, which stops firm to enter in the market. Firm increases its scale plant so that established firms accommodate after permitting to sell the quantity of Q_E commodity, when its demand curve is DF_1. Decreases their buyer as the quantity of production sells by the firm.

2. Quality Constant

In this condition, entrant firm expects from the established firms that they retain their quantity of production constant before entry level. As it is shown in Fig. 1.3, established firms will produce limit

Fig. 1.3



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production Q_L and will sell them at limit price P_L on the given maximum scale of plant to stop the entry. Minimum and maximum plant produce possible entrant firm Q_E which fulfils its average production cost. Therefore, G is the **Scale Barrier** or entry gap for this firm. If established firms put their production on Q_L level and permit new firm to enter in the market and to sell their minimum maximum production Q_E then quantity production Q_E will increase in the market. It will be $OQ = OQ_E + OQ_L$. As a result, market price will fall little than competitor price P_C because established firms put their production before entry level and permit collected entrant firm production to reduce the price.

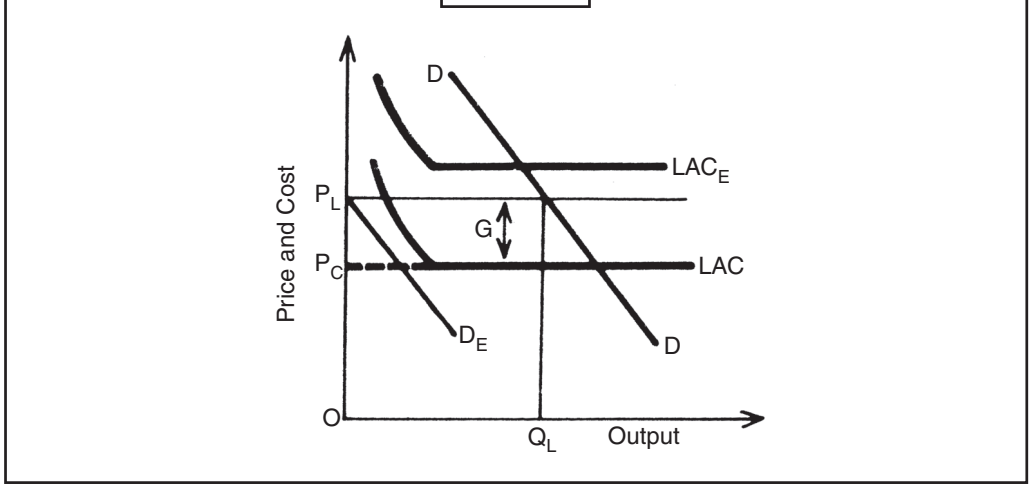
Task Give your opinion on Constant Price.

Absolute Cost Advantages

According to **Bain**, absolute cost barrier can be obtained by – (1) utilising the best production technique by established firms by the secrecy or patent; (2) only one ownership of majorof collection of resources established firms (3) unable to use the resources of necessary production by like capacity of obtaining the organizing services, labour means, constituents, etc. on the favourable conditions by the entrant firms which is obtained by established firms. (4) Working of established firms of close to the sources raw materials. (5) less favorable conditions of untidy sum for investment of is entrant firm, which imaged in the simple availability of sums in high effective interest or necessary quantities (6) less cost due to the production reaction of established firms and (7) less price of raw materials due to the only one purchase agreement with sale in large quantity or wholesaler by the established firms.

If established firms obtained these absolute cost advantages, then they work as of barriers of the entry new firms. If these costs are given then established firms can earn benefits on those prices which are less than the cost. Entry of firm can be terminated by lowering down the average production cost by fixing the limit price. It is shown in Fig. 1.4 that LAC is the long-term average cost curve of established firms. They fix limit price (or entry barrier price) P_L and demand curve DD fixes limit production Q on this price. LAC_E is the long-term average cost curve of possible entrant firm which is even higher than limit price P_L. Demand curve of this firm is D_E which is parallel to market demand curve DD. This demand curve D_E is situated under LAC_E of possible entrant firm, so that this firm cannot fulfill its

Fig. 1.4



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production cost on any production level. Therefore, this cannot earn benefit. In this way, it is impossible to this firm to enter in least right market. G is the entry gap which represents that established firms can fix limit price above its LAC without attracting entrance.

Choice of Entry Barrier: According to **Bain**, choice of entry barrier will depend on demand curve on entry limit price, shape of cost curve and expectations about their plans and expectations of entrant firm etc.

Rate of Entry: **Bain** emphasizes on market portion and speed of entry till the rate of entry of new entrant firms are possible. Faster the rate of entry, more flat will be the demand curve of least right industry above the entry limit price. Slower the rate of entry, lesser will be the importance of entry barrier. Market portion of entrant firm will be more in first condition and less will be in second condition.

Self Assessment

State whether the following statements are True/False:

9. **Bain** describes six possible expectations of possible entrant firm.
10. Entrant firm expects constant price on after entry level.
11. **Bain** understands only amount very expensive to obtain sums for new investment firms.
12. If three sources of entry barrier are taken together then limit price distribution becomes very complex.

1.2 Its Criticisms

Bain is the first economist who proposed limit price determination theory with the fear of entry. Instead of this, following limitations are found:

1. According to **Silberstein, Bain** did not make a general principle of price under least right conditions. He mainly established that which factor makes barriers in new competition in the industry mainly in some experienced studies.
2. According to **Koutsoyiannis**, the biggest fault of **Bain's** Model is that he focuses his studies on the entrance of new firms. He does not include takeover of firms, potency of diffusion by the established firms and cross entry in his studies.
3. **Bain** does not give exact to estimate or measure the rate of entry.
4. He does not explain the shape and benefits of entrant firm which can affect the fear of entry.
5. **Bain** only considers on entrant firm, where it is more fear of a big group in comparison to one or two entrant firms. Some nearby or similar firms can present more fear of entry because of technological closeness.
6. According to **Koutsoyiannis**, **Bain** has failed to see that product differentiation and economies of scale can increase the possibilities of entry.

1.3 Summary

- If three sources of entry barrier are taken together then limit price distribution becomes very complex. They can make strong each other or can dest may their effects. For example, can make large economy of scale and very high barrier of product determination entry as shown in Fig. 1.5, represents a big entry gap between high limit price P_H and competitor price P_C. Limit production Q_H is very less. Therefore, a big entry gap and less production conditions are obtained by the established firms. As a result, entry is terminated because entry barrier is very high.

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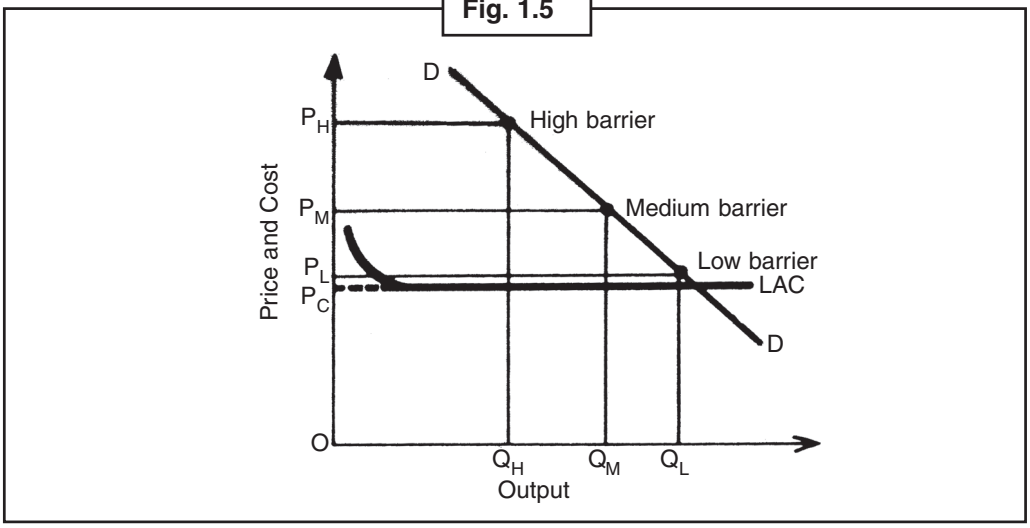
Fig. 1.5



- On the other hand, a big possible entrant firm which has more economies of scale and more quantity of money is available and other cost benefits can soon entry compelled to put low barrier of established firm by the fear of soon entry. In this way, this firm can compelled to fix close limit price of established firm. This is shown in Fig. 1.5 and as a result entry gap $P_L - P_C$ is very less limit production, Q_L is more.

1.4 Keywords

- **Barrier:** Fence, Difficulty
- **Entrant:** One who enters
- **Absolute Cost:** Complete cost
- **Rate of Entry:** Entry limit price

1.5 Review Questions

1. What is the **Bain's** Limit Price Theory? Explain.
2. Describe the **Bain** Model.
3. What do you mean by Product Differentiation?
4. Briefly explain 'Absolute Cost Advantage'.

Answers: Self Assessment

1. Accommodation	2. Firms	3. Unification	4. Collusion
5. (a)	6. (b)	7. (c)	8. (d)
9. True	10. True	11. False	12. True

1.6 Further Readings

Books

1. **Microeconomics**—*Frank Cowbell, Oxford University Press, 2007.*
2. **Microeconomics**—*Shipra Mukhopadhyay, Annie Books, 2011.*
3. **Microeconomics**: **An Advanced Treatise**—*S.P.S. Chauhan, PHI Learning.*

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Unit-2: Profit Maximization and Full Cost Pricing Theories

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Objectives

Introduction

2.1 Profit Maximization Theory

2.2 Theory of Full-Cost or Average Cost Pricing

2.3 Summary

2.4 Keywords

2.5 Review Questions

2.6 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand Full Cost Pricing Theories.
- Know Profit Maximization regarding perfect competition.
- Explain the criticisms of Full Cost Pricing Theories.
- Understand Theory of Average Cost Pricing.

Introduction

The main objective of Firm's new-classical theory is Profit maximization. But more of experiences certificates indicate another objective of firm as sales maximization, production maximization, satisfaction maximization, utility maximization etc. Some of the theories will be analyzed in next chapter. This chapter analysis in the form of first research of Firm's new-classical theory, and Theory of Full-Cost or Average Cost Pricing by **Hall, Hich** and **Andruz**.

2.1 Profit Maximization Theory

The main objective is full cost pricing of any commercial firm in firm's new classical theory. Firm maximizes the profit when it satisfies two rules (1) MC = MR and (2) MR curve is cut by MC curve from bottom. The meaning of profit maximization is accurate profit which is greater than the average cost price of a product. This is the amount which is left with the producer after making the entire payment, it also contains the wages of management. In other words, it is Residual income, which is more from average profit. The condition of profit maximization of firm is described through—

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Maximize $\pi(Q)$

Where $\pi(Q) = R(Q) - C(Q)$

Where $\pi(Q)$ is profit, R(Q) arrival, C(Q) cost, and Q is the sold units of production.

Above description about rules and condition of profit maximization are applied to perfect competition firm and monopoly's firm.

Its Assumptions

The profit maximization theory is based upon following points:

1. The purpose of firm is profit maximization where the difference between arrival and cost profit.
2. Producer is owner of his own firm.
3. Interests and habits of consumers are constant.
4. The technologies of production are given.
5. Firm produces goods which are perfectly individual, separated and full of standardization.
6. Firm has the complete knowledge i.e. on how much cost and quantity of a product can be sold.
7. Firm has certain knowledge about demand and cost.
8. New firm can enter with long time period in industry. In short time, it is not possible.
9. Firm makes profit maximization in some time horizon.
10. Firm makes profit maximization in both short-term period and long-term period.

Self Assessment

Fill in the blanks:

1. The main objective of a firm's new classical theory is ..... maximization.
2. The mean of profit maximization is accurate profit which is ..... than the average cost pricing of product.
3. Firm ..... its profits.

Profit Maximization Under Perfect Competition

In perfect competition, the firm is one of the units from the more production unit. It can't influence the market price. It is the only Price Taker and Quality Adjuster. It takes decision of only of those products which are to be sold, so that it sells on market price. Therefore, the MR curve of firm is similar with AR curve under perfect competition. MR curve is parallel to x-axis. Because the price is decided by the market and the firm can sell the product on same price. In this way the firm is balanced when MC = MR = AR (price). The balance of firm's profit maximization is shown in Fig. 2.1, where MR curve cuts the MC curve at the first A point MC = MR. But it is not the point of profit maximization, because MC curve is sloping down from MR curve after "A". For a firm, the minimum production OM is not profitable because firm can take more advantage by doing more production from OM. But the firm stops the production when it reaches on OM_1. OM_1 is the particular level of production where the both conditions of balancing are fulfilled. If firm wants to make more production from OM_1 it will have to bear losses. Because maximum cost is increased from marginal arrival after balancing point B. So the firm maximizes the total profit in the cost of M_1B and the level of production OM_1.

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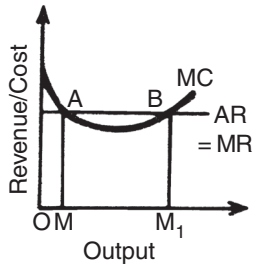
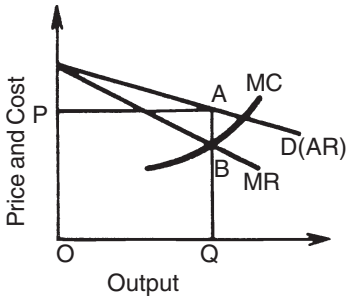
Fig. 2.1



Profit Maximization Under Monopoly

In the monopoly the firm itself is the seller (or producer) of a product. Therefore, its demand curve is sloping down from right. It is assumed that interests and habits are given. It is the price maker and it decides the maximum price and maximum profit. But it does not mean that it can fix both the price and quantity of production. If the firm makes the level of production, so its price is decided by marked demand. Or if it decides the price, so the production level will depend upon the demand of product by consumer. However, in any situation, the monopoly firms have only aims to maximize the profit. The condition of monopoly is (1) MR = MR < AR (price), and (2) MR curve is cut by MC curve from down.

Fig. 2.2



In the Fig.2.2, OQ is the production level for profit maximization and price is OP for profit maximization. If production is more than OQ, MR will be high from MC and the level of profit will be down. If cost and demand are same, firm will not get the motivation to grow the price and production, and then firm is balanced.

Notes The aim of a commercial firm is profit maximization in new-classical theory of a firm.

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Criticisms of Profit Maximization Theory

Economists have strictly criticized to profit maximization theory through following points—

1. **Profits Uncertain:** It is thought that in profit maximization**,** firms are totally certain, but profit is not same anymore, because it is obtained by income and future cost, so it makes impossible to maximize the profit in such a type of uncertainty.
2. **No Relevance to Internal Organization:** Firm is not directly interconnected with internal organization. For example, some management destroy so much money that if the destroyed money is saved so wealth of firm and profit can be maximized. The management is responsible for growing total property and sells. Apart from this, the management tries to make lower cost and grow the efficiency through a program. The management work is real fact rather than more capital of stockbroker.
3. **No Perfect Knowledge:** The theory of profit maximization is based upon full knowledge of cast and arrival of own firm as well as another firms. But the fact is, firms do not have full knowledge in which they work. Actually, they have knowledge about their product and cost, but they cannot be sure for the demand curve of market. They always work in uncertain condition and by this way it becomes so weak profit maximization theory because it is considered that firm is sure for everything.
4. **Empirical Evidence Vague:** Empirical Evidence Vague is not clear on experiential level. Many firms don't agree regarding profit as a main aim. The work technique is so complex of latest firms, so they do not think only the profit maximization. Their main problems are controlling and administration. The administration's work of firms is not done by producer; it is done by managers and shareholders. They are more interested in their salaries and profit commission. Because high-tech firms are totally separate from power of controlling, so their mode of work is not oriented to profit maximization.
5. **Firms do not Know About MC and MR:** The fact is that the firms are not worried for calculation of maximum cost and marginal arrival in commercial field. Most of them are not familiar with these words. Many of them do not know about the demand and arrival curve. And some do not know about their basic cost structure. The experimental proof of **Hall** and **Hitch** showed that firm has no knowledge of marginal cost and marginal arrival. Although they are not greedy machine for assumption. As **C.J. Hawkins** said, "To give the logic that the purpose for all the firms is only profit maximization is not logical, and this is as similar logic than every student wants to get maximum marks in examination by hook or crook."

Self Assessment

Multiple choice questions:

4. In short-term and long-term, the firm does ..... his profit.
   (a) maximization (b) minimization (c) normalization (d) none of the these
5. Under perfect competition, firm wants to become ..... among other products.
   (a) excellent (b) first (c) last (d) none of the these
6. Most of the firms do not consider profit as ..... .
   (a) a main purpose (b) main product (c) main firm (d) none of the these

6. **Principle of Average Cost Maximizes Profits: Hall** and **Hitch** concluded that firms do not apply the principle of equilibrium in MC and MR to maximize short-term profit. But their aim is to maximize the profit in long-term. They fix the price on average cost theory, not on marginal theory. According to the principle, price = AVC + AFC + profit margin (which is generally 10%). Thus, the main purpose of profit maximization is to fix the price on the basis of the principle of average cost, and then sell the production on same price.
7. **Static Theory:** New classical theory of the firm is static by nature. This does not tell about the duration of short-term or long-term. The time period of neo-classical firm is equal and independent periods. Decisions are taken freely. This is the big lack of theory of profit maximization. In reality the decisions are 'mutually dependent and time bound.' This means, a decision is affected from the

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other last decisions, and it will affect the upcoming decisions of firms. This correlation is bypassed by neo-classical theory.

8. **Not Applicable to Oligopoly Firm:** Practically, in economic theory, the purpose of profit maximization is for perfect competitor or oligopoly or oligopoly competitor firm. But in oligopoly firm, it is left due to its criticism. Thus, the purposes added by the economists in this theory are mainly related to oligopoly or two-oligopoly.
9. **Varied Objectives:** The difference base of neo-classical firm and modern corporation is that the aim of profit maximization is related to producer's behaviour while the aim of modern corporation is basically related to various ambitions of shareholders and management. The shareholders do not affect in management working arena. In 1932, **Barle** and **Means** told that the purpose of management is far different from shareholders. The management has no interest in profit maximization. They operate the firm in their own favour rather than for shareholders. Shareholders cannot affect them any more due to having no knowledge of company. Most of the shareholders cannot present in annual meetings. In this way, the modern firms are motivated from those purposes which are related to internal organization.

Did u know? The firms make profit maximization in short-term and long-term.

2.2 Theory of Full-Cost or Average Cost Pricing

In 1919, **Hall** and **Hitch** from Oxford University campaigned for profit maximization. For this, they have created the base of questionnaire of 38 industrialists. In this 33 were producer, 3 were retailer, and 2 were manufacturer. **Hall** and **Hitch** obtained the information about their efforts under estimated maximum cost and income to make them similar, their demand flexibility. Information obtained from those responses, most of them did not effort to estimate the demand flexibility or maximum cost directly or certainly. They did not thought about the relevance of this in price decision process.

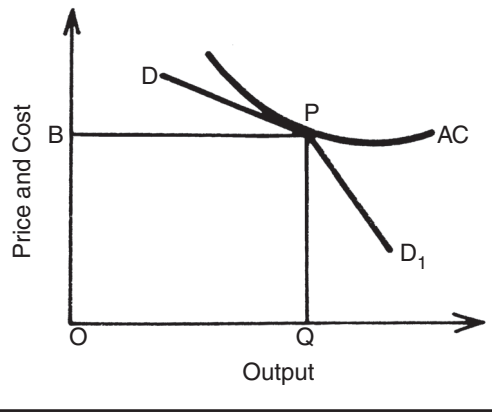
Hall and **Hitch** have concluded on the basis of their empirical study that many industrialists consider the full cost on the basis of sales value, they do not justify the similarity of marginal cost and marginal income, and they include the profit commission. This way the best price is based upon full or average cost which should be made by view of correct competition under oligopoly.

But what is full cost? Full cost is full average cost in which the average changeable cost (AVC), deposited average other cost (AFC), normal margin for deposit and profit. Thus, price (P) = AVC + AFC + profit margin (normally 10%). According to **Hall** and **Hitch**, there are some reasons to follow the theory of full cost pricing by firm: (*i*) silence or diplomat agreement between producers (*ii*) not succeed to know the priorities of customers (*iii*) responses of competitors due to changes in price (*iv*) moral trust of justification and (*v*) uncertainty of influences of price variations. These reasons stop the oligopoly producers to decide others price except deciding the price of full cost.

Thus, firms fix the prices on the basis of full cost principle and sell according to market demand. They saw that in spite of demand and cost changing in oligopoly, price is constant in market. They explained the stability of price by kinkit demand curve. This kinkit on that point where in Fig. 18.3, the fixed price OP (= OB) on full cost theory. Above from this level, the sell of firm will be reduced because competitors will not follow to raise the price. Because PD part is flexible. On the other hand, firm reduces the price from QP. Its is competitors will to reduce price. The sell rises but profit is less. Because PD_1 is less flexible. So in the situation of high or low price, non profitable condition is applicable to firms. So whenever there is no changes in price of factors (like raw material etc.) firm will be constant on price QP.

Notes

Fig. 2.3



Because AC curve gets down in the is large range of production, so change in price is totally opposite from production. When the production is level down, the average cost will be more and price will be high. But **Hall** and **Hitch** do not agree on this possibility that oligopoly firm makes less production and take more prices. For this they give 3 reasons (a) oligopoly firm gives priority to price constant (b) they cannot raise the price due to kink and (c) they think, the plant will work till maximum capacity.

Hall and **Hitch** have analyzed two exceptions of fixed price. (1) if a demand is low and so on, price can be reduced for continuing the production level. It can be happened, as whatever said when lower part of demand curve is become flexible. When the firm is in difficult condition, price is reduced and forces for same to other firms. Any condition when the changes in technology, it influences the AC curve of firm. So, full cost value QP(= OB) is evaluated.

Self Assessment

State whether the following statements are True/False:

7. In 1932, **Barle** and **Means** explained the purpose of management is totally separated from stockholders.
8. Modern firms are not motivated from the purpose related to internal corporation.
9. Oligopoly firm gives more priority to constant the price.
10. Kinkit demand curve makes complex to the analysis.

Andrews Version

The description of **Hall** and **Hitch** is based on assumptions that firm has already decided the price which is to be taken in market then kinkit demand curve makes complex to the analysis. So for making the description easy about full cost prices, **Andrews's** explanation is given.

Prof. Andrews explained, how a firm fixes price on the bases of full cost and average cost. Firm divides the current total cost from total production to know the average real cost (AVC). On the other hand, curve is parallel to some parts of production axis, if price is shown.

Generally, a firm will state a price for a special product it will must equal to the real product making cost plus costing margin or mark up. The cost decision boundary would generally fulfill the factors of inputs and will provide the pure profit in terms of all industries.

Notes

Cost rise or cost decision boundary formula is,

$$M = \frac{P - AVC}{AVC}. \text{ So, } P = AVC\ (1 + M)$$

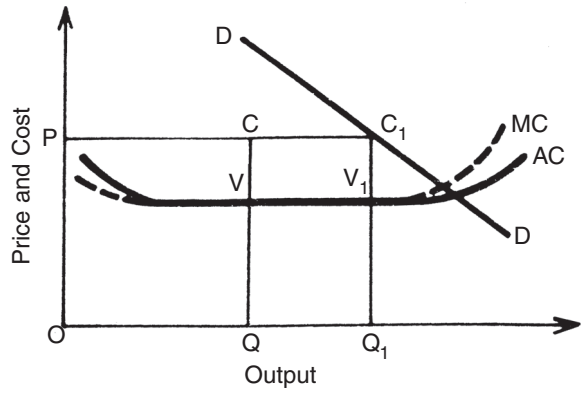
Where, M is increased value, P is price and AVC is average substitution cost.

Suppose AVC of firm is = ₹ 100 and firm M = 0.25 or 25%. Firm will decide, price P, ₹ 100 (1 + 0.25) = ₹ 125. When this price is chosen by the form whatever its prodoction, then mark-up should be constant. But there will be still possibility of changes in mark-up (M) by the direct sources of production.

Depending on the firm capacity and available factors of production (wages and raw material), there is no possibility of change, whether the production level is anything. On that price, firm will sell the quantity demanded by customer.

But how the production level is decided? This is decided in any manner from these three—(a) percentage of production capacity or (b) in the form of last sold production in its production time period or average production which is to be sold in future. If a firm is new or starting a new product first and third point will be noted. This may be possible first will be match with third because the capacity of plant will depend upon possible sells in future.

Fig. 2.4



Full cost pricing of **Andrews** is shown in Fig. 2.4, where AC is parallel line in broad range of production. MC is marginal cost, suppose a firm selects a production level OQ, on this level QC is total cost. Therefore, the selling price of firm is OP = QC. Firm will take to continue this price OP but it can sell more the demand of product. As DD demand curve is shown. In this condition, it will sell the quantity of product OQ_1. This price will not be changed due to demand of product.

Task Describe your views on **Andrews'** explanation.

Its Criticisms

Mayculp, **Robinson**, **Kaahan** and other economist have criticized the theory of full cost pricing on the following bases—

1. **Not Free from Profit Maximization:** The critics such as **Robinson** and **Kaahan** as more described that full cost pricing theory is not free from the theory of profit maximization in which it is found through the investigation by **Hall** and **Hitch** of firm's cost pricing decision. As **Hall** and **Hitch**

Notes

described in individual demand curve, the price of product on kink that is profit maximization price in marginal cost in large area and this cuts marginal income curve in discontinuous way.

2. **Whose Full Cost:** The main error of this firm due to failing of describing firm, where full cost will decide the price in oligopoly market and other firms will follow this price. Thus the possibilities of leadership of price are included in which **Hall-Hitch** and **Andrews** did not think.
3. **Firms do not Follow Rigid Prices:** Theory of full cost pricing is criticized due to joint with constant price. Firms generally down their pricing in crisis and up their prices in good condition. Thus firms follow independence price theory rather than fixed price.
4. **Profit Margin Vague Concept:** Apart from this, "Good Profit Condition" or "Fixing of Cost Price" as **Andrews** states is not clear. It is clear in theory, how cost determination limit is determined and is applied by the firms. Firm can put less or high price depending upon the cost and demand of product.
5. **Weak Empirical Basis:** The implementation of full cost theory is weak for two reasons. (i) All 30 firms, who accepted the theory, only 12 from them follow strictly. But these firms were trying to add in cost varied estimated production. Some firms have taken full cost, but few of them accepted real or preplanned production. Other 18 firms usually accepted full cost but in market time, firms are got ready to put lower price, in this situation only 2 firms told that, they would grow the price in good time. In this way various firms have explained theory of full cost. (ii) **Hall** and **Hitch** told that most of the firms were not clear about flexibility and they did not try to get the demand estimation. And the firm who did this, they obtained useless information.
6. **Full Cost Principle not Obeyed Strictly:** Apart from this, in the process of pricing decision through experimental studies in England and America, information come to know that firms estimate an average type of price decision but they do not follow principle strictly. As **Bain** has written that the group of merchants do not want to say to economist about how they decided their prices, and how is relation with opposite firm. By doing this they do not want to bare losses or do not want governement interference. And they could make good image.
7. **Firms Follow Marginal Principle:** Last but not the less important, there is no support for **Hall** and **Hitch's** full cost pricing principle in the **Earlay's** study of 110 companies which are operated in America in good position. **Earlay** has not seen trust in the theory of full cost. He told that, most of the firm adopted the methods of price decision, marketing and new product. He told this price determination theory of firms as "gone away frontier".

In spite of these criticisms, full cost theory was the first effort by economists for the study about commercial firm's behaviour and after this, **Simon**, **Williamson**, **Baimol**, **Morris**, **Sayart** and **March** have studied the investigation about the firm's behaviour .

2.3 Summary

- Profit maximization theory is based on the assumption that, the firms have all the own knowledge and cost and arrivals of other firms but the fact is that the firm has no full knowledge by this they work. Actually, they know about their production cost, but cannot be assured for demand curve of market. They always work in uncertain condition and by this way it becomes weak to the theory of profit maximization because it is considered in theory that firm is sure for everything.

2.4 Keywords

- **Price-Maker:** Making the Price
- **Separation:** Isolation
- **Duration:** Time Period.

2.5 Review Questions

Notes

1. What is the theory of profit maximization?
2. Explain the theory of full cost or average cost pricing.
3. Comment on "Andrews' explanation".
4. Describe the criticism of theory of full cost pricing.

Answers: Self Assessment

1. Profit	**2.** Excess	**3.** Maximization	**4.** (a)
5. (b)	**6.** (a)	**7.** True	**8.** False
9. True	**10.** False		

2.6 Further Readings

Books

1. **Microeconomics: An advanced Treaties** — *S.P.S. Chauhan, P.H.I. Learning.*
2. **Microeconomics: Behaviour, Institutions and Evolution** — *Sampool Bowels, Oxford University Press, 2004.*
3. **Microeconomics: Principles, Applications and Tools** — *Sanjay Basotiya, DND Publications, 2001.*

Notes

Unit-3: Behavioural and Managerial Theories of the Firm

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Objectives

After studying this unit, students will be able to:

- Understand growth maximization theory of Marris.
- Understand the criticism of Marris model.
- Know Baumol's Sales Maximization Model.
- Know the basic of model.

Introduction

Some important firms' behaviour related and administrative theory are discussed in this unit. Those are—The satisfaction theory of **Simon**, the behavioural theory of **Syert** and **March**, the management theory of **Williamson**, growth maximization theory of **Marris** and **Baumol's** Sales Maximization Model. These concepts are based on those assumptions which are purely different from the profit maximization of neo-classic theory. These theories represent differences between managers and owners of big firms. We will discuss the behaviour related and administrative theory of firm.

3.1 Growth Maximization Model of Marris

Marris has developed a growth maximization model of a firm in economics and mentioned in his book *The Economic Theory of Managerial Capitalism (1964)*. He proposed the theory upon that the modern big firms have run by managers and shareholders are owner who take decisions for managerial status of firms. Managers want to grow the rate of production of firm and shareholders want to grow their shares and profits. To maintain a relation between firm's growth and price of shares, **Marris** has developed a steady state model, in which manager selects a fixed growth rate on

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which the assets and selling profits etc. are grown. If he selects the high growth rate then he needs to pay on advertisement and R&D for making new product and demand. So he will take more average profit percentage to himself for spreading the firm. As a result, the profit distributed to shareholders will be less and thus, the price of share will decrease. The treat to take over the firm with managers will see. Since managers are keen interested to safe their jobs as well as firm's growth, so they select a growth rate, which gives the maximum rate to shares, gives satisfied profit to shareholders, and prevents that firm to take over by another. On the other hand, owner (means shareholders) wants the stable growth of firm because by this he gets good return of the capital. So the purpose of managers and shareholders are similar and both want to get a perfect stable growth for firm.

Self Assessment

Fill in the blanks:

1. Oligopoly is not ..... to others.
2. All main items like profit, selling and ..... grow in a similar rate.
3. Firms grow by ..... .

Its Assumptions

Marris model is based on following assumptions:

1. It applies a fixed price base.
2. The production cost is given.
3. Oligopoly is not related to each other.
4. The service price has given.
5. Firms are grown by diversification.
6. All main items like profit, selling and cost grow in a similar rate.

The Model

On the above assumptions, the purpose of firm is to maximize its growth rate (G). G itself depends upon two factors – first, the growth rate of product for firm; and second, the growth rate (GS) of capital fund. Thus, G = GD = GS.

However, the ownership is different from administration in all modern big firms, but the main purpose of managers and owners is the stable growth of firm. According to **Marris**, there are two utility functions for the owner of firm and managers. The utility function of managers includes his income, power, security of job etc. while the utility function of owner includes profit, capital, parts of market etc.

Thus, the purpose of manager of a big firm is to maximize his utility and his utility depends upon the growth rate of firm. However, the main purpose of him is to maintain the growth of firm, but he also needs to secure his job. The security of job of manager depends upon the satisfaction of shareholders, whose main purpose is to maximize the share price as well as the profits. Marris analyzes those factors by which firm try to fulfill its profit maximization growth. The firm produces new product, creates demand for new product and expands its shape. **Marris** told this **Differentiated Diversification**. To create a new product depends upon rate of diversification, advertisement expenditure, R&D expenditure etc.

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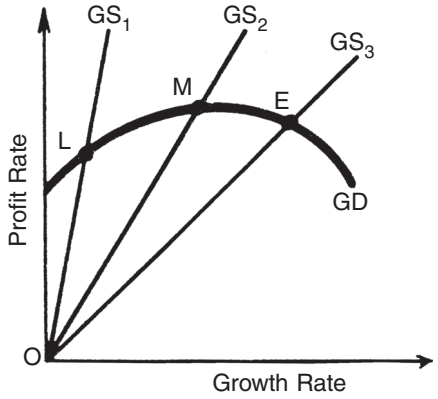
Notes The security of job of manager depends upon the satisfaction of shareholders, whose main purpose is to maximize the share price as well as the profits.

Marris has mentioned the relation between growth and profit by diversification of new product. The relation between growth and profit is different in various levels. In this growth-profit relation, growth is determined to profit. When the growth rate of a firm is low, the relation between them is positive. When new products are created, firm advertises and profit creates. The growth-profit relation gets negative when the growth rate rises by diversification of new products. This happens due to managerial Constraints which prevents the further growth of firm. The managerial ability is limited to face more than extra changes in firm. To promote and marketing of the new product, there is no possibility to develop a big team of administration. For the high rate of diversification, the R&D and advertisement cost is more. As a result, after a fixed growth rate, there is lower profit rate by high growth rate. It is shown in Fig. 19.1 where GD curve rises first, goes to high point M and downs further. Another factor of growth-profit is the growth rate of capital supply. The purpose of shareholders is to maximize the growth rate of capital stock. The main source for its growth is profit. So the profit determined towards supply. It collects more funds from capital market. Thus it provides funds for high growth rate. It gives negative and positive relation between profits and growth. It is shown by a straight line GS from original in Fig. 3.1.

For equilibrium of a firm, the profit growth and growth supply should be satisfied. It happens when both the curve GD and GS cut on a point where growth-profit is optimum. Suppose that in Fig. 19.1 GS_2 curve cuts GD curve on point M, then profit maximization happens. This point does not give optimum solution because it needs more growth which does not match with profit in long run. As long they take growth curve to point M, it shows the desire of his job security. His job security is in danger positive while shareholder feels that the price of share and profits is decreasing and another firm will take over this firm. It will affect the growth rate of capital supply (GS).

According to **Marris**, Reciation Ratio determinesd the growth rate of capital supply. If reciation ratio is low, it means all profits are distributed among shareholders. As a result, there is limited fund for firm growth available to managers and the growth rate will be very low. The growth-supply curve will like GS_1 curve. The equilibrium point of firm will L, where GS_1 curve cuts GD curve. This is also not the optimum equilibrium point of firm because on this point, the growth rate is low and profit is low from its maximum level.

Fig. 3.1



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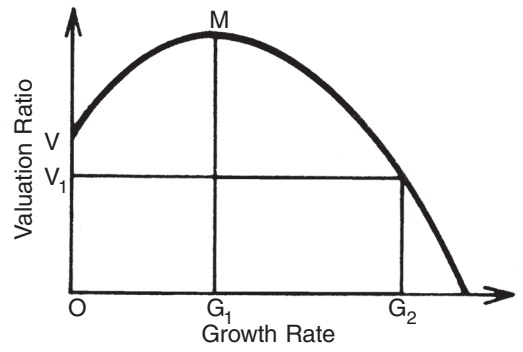
For growth of a firm, managers need to get more reciation profit for investing more funds. This rises the reciation ratio, which further gets close to high profits and high growth rates until the profit point not goes to M. This is also not a optimum equilibrium point of firm because managers feel that the combination of high profit and high growth rate is approved by shareholders and it does not affect his job. So he will want to get more reciation ratio, will invest more funds, will advertise and will grow the firm's growth rate. As a result, growth-supply curve will flat and will look like GS_3 as shown in the place of GS_3 curve where cuts at point E in Fig. 3.1. On this point, the distributed profit is low for shareholders. But it is in good quantity to satisfy the shareholders. There is neither fear of falling price of shares not to controlled this form by the forms. Job is secured for the managers also. Thus, point E is the optimal balance point of the form. If managers apply more reciation ratio then the distributed profit will decrease more and the shareholders will not satisfy which warned the job security to them. Current shareholders can take decision to change managers. If the distributed profit among shareholders gets low and thus, the share prices fall then that firm can take over by another.

Marris has defined the fear of takeover the firm by another in the form of valuation ratio, which works as a blockage in its growth rate. Valuation ratio is the ratio with its book price of the share of the firm. According to **Marris**, firm will not want to grow after a point because high point is warning for financial security and they will need minimum analysation ratio which gives the optimum factors of scale to shareholders. The valuation ratio can be affected by the rate of new shares. The relation between valuation ratio and growth rate has described in Fig. 3.2, where the valuation ratio is shown in horizontal axis while growth rate is shown in vertical axis. The share of valuation ratio is parabolic which is V. This is due to stock market behaviour and growth rate in equation of G. When growth rate is G_1, the top most point of valuation ratio is M. In this point, when growth rate increases then profit rate also increases. The growth rate of firm is expected to rise as point M of G_1. This happens because the managers will be ready to exchange the profit of high valuation ratio against the high growth rate of firm. So they will select high growth rate G_2 and valuation ratio V_1 accordingly. This is minimum valuation ratio which protects the firm to take over and gives high returns of scale.

Fig. 3.2



Self Assessment

Multiple choice questions:

4. According to **Marris**, the valuation ratio does ..... to the growth rate of capital supply.
   (a) fixed (b) low (c) more (d) none of these
5. The valuated profit is average of total profit is ..... average.
   (a) opt (b) rest (c) equal (d) none of these

Notes

6. For growth of firm, managers need to get more reciation profit for ..... more funds.
   (a) expend (b) invest (c) exchange (d) none of these

Its Criticism

The growth maximization mode of **Marris** has been criticized by **Koutsoyiannis** and **Hawkins** due to its following assumptions—

1. **Marris** proposed the price structure of firm. So he does not explain that how prices are determined in market. It is a big demerit of this model.
2. The another main demerit of this model is it does not accept the correlation between oligopoly firms in non-collusive markets.
3. This model does not explain the dependency of non-price competition.
4. Model is based on that assumption that firms can grow easily by creating new products. This is unreal because no firm can sell anything to consumer. The consumer wants a unique brand which can change with the new product.
5. According to **Koutsoyiannis**, the model of **Marris** basically applies on those firms which produce consumer goods. This model does not explain the exchange industry or business of businessmen.
6. **Marris** has collected the expenditure of advertisement and R&D in his model. It is another demrit of this model because these units are not same in a given period of time.
7. **Marris** assumes that firms have its own R&D department on which they expend more to get a new product. But in fact, most of the firms have no R&D departments. They follow the notion of other firms for product diversification and give royalty to develop models.
8. The assumption that all units like profit, selling and cost increase in a same rate is excess.
9. The assumption is that firm will grow in a fixed rate. The firms grow in a fixed rate but later slowly.
10. It is impossible to decide that point which makes the market value of share of firms as maximum and firm can overtake by another.

3.2 Baumol's Sales Maximization Model

Prof. Baumol has proposed administrative theory of firm in his book *Business Behaviour, Value and Growth* (1967) on the basis of sales maximization. He described two models of sales maximization – One static model and second dynamic. We would discuss only the static model with single product without advertisement, with advertisement and various product models.

Its Assumptions

This model is based on following assumptions:

1. Firm has a period of time.
2. Firm wants to get more to its total selling revenue in long run which is fixed with its profit constraints.
3. The minimum profit balance of firm is fixed competitively with the price of its share in market.
4. The firm is oligopolistic which cost curve is U-shaped and the slope of demand curve is downward. The total cost curve and revenue curve are traditional.

The Model

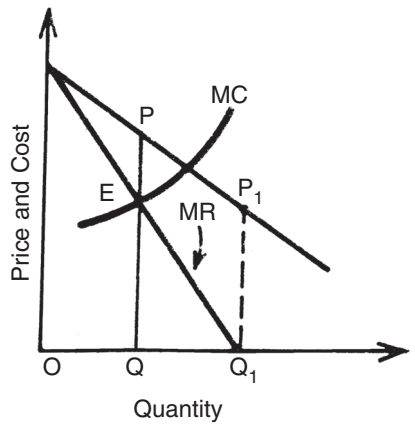
To check the oligopolistic firms in America, **Baumol** has found that they follow the purpose of sales maximization. According to **Baumol**, in modern firms even the management and owner are divided,

Notes

the managers want high salary and designation on the cost of sales maximization on profit cost. As a consultant of various firms, **Baumol** has seen that when he asked various managers about the last year business then they always replied, "Our sale has increased by three million dollar." Some other managers replied they, "May God increase their sales." They do not talk on their profits. So according to **Baumol**, the revenue or sales maximization and not profit maximization does match with firm's behaviour. But the purpose of management is sales maximization for short and long run. He gives many proofs to support his theory. According to him, a firm gives more important to its shape of sales and thinks more if sales get low. If the sales of firm get low then the bank, lender and capital market do not ready to give fund. Its own stockist and businessman do not take interest on it and consumer also does not want to buy their product because it is getting in lost. But if the sale of firm is high then shape of firm is also increased means it gets profit more.

Model with Single Product—The sales maximization means maximized total revenue as per **Baumol**. It does not mean increasing of sale of quantity product but increase in monetary sales (like Rupees , Dollar etc). The sale can go to profit maximization where marginal cost and marginal revenue are same. But if it increases from this point, then the profit remains same and monetary income increases. But the oligopolistic firms want that it monetary income should increase even its profit is minimum. The minimum profit depends by the necessity of sales maximization and to continue profit of sales. It is essential to invest monetary money in future. According to **Baumol**, "Maximum revenue will only get on the production where the elasticity of demand is equal to units means the marginal revenue is zero which is the condition for profit maximization in equal marginal revenue." It has shown in Fig. 3.3 where profit maximization firm produces OQ quantity which MC and MR curve meet on point P but sales maximization firm will produce the quantity where MR curve is zero.

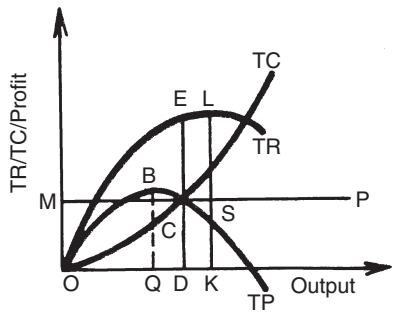
Fig. 3.3



The **Baumol** model is shown in Fig. 3.4 where TC is total cost curve, TR is total revenue curve, TP is total profit curve and MP is minimum profit or profit constraint line. Firm gets its profit maximization of production on OQ level of TP curve's highest point B. The purpose of product firm is sales maximization and not profit maximization. Its sales maximum production is OK where total revenue KL is maximum on the highest point of TR curve. Sales maximization is subject to minimum profit constraints. Suppose that minimum profit level is shown by MP line. DE will not maximize the production sale because the minimum profit OM is not done by total profit KS. It is the level of OD production, where minimum profit DC (= OM) is according to the price DE/OD of total revenue DE.

Notes

Fig. 3.4

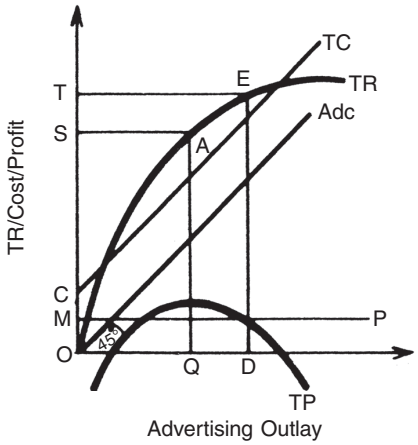


The oligopolistic **Baumol** model describes that the maximum profit production OQ will low by maximum sale production OD and price will high. The reason behind the price is low in sales maximization is that the total production and the total revenue are on high, while in profit maximization; total production is lower than total revenue. Suppose that in figure QB is jointed by a line TR. According to **Baumol**, "If on the point of minimum profit, firm gets more profit than essential minimum, then the profit maximization firm will get profit by lower their price and increase in physical production."

Model with Advertising—Further **Baumol** has indicated that the profit constraint is effective in sales maximization and increases the revenue of firm. The expenditure in advertisement is in vertical axis and total revenue, cost and profit are in horizontal axis in Fig. 3.5 TR is total revenue curve. 45° line ADC is advertisement cost curve. By collecting in ADC curve, as equal to OC a fixed amount other cost; we get the total profit curve TP which is the difference between TR and TC curve. MP is minimum profit constrain line. Profit maximization firm will expend OQ in advertisement and its total revenue will be OS (= QA). On the other hand, on given profit constrain MP, sales maximization firm will expend OD in advertisement and the total revenue OT (= DE) will earn. Thus, the sales maximization firm expends more in advertisement than profit maximization firm (OD > OQ) and earn more revenue (DE > QA) on profit constrain level MP. So the sales maximization firm will get profit by increasing the advertisement cost until the profit constrain prevents it.

Did u know? According to **Baumol**, sale maximization means maximization of total revenue.

Fig. 3.5



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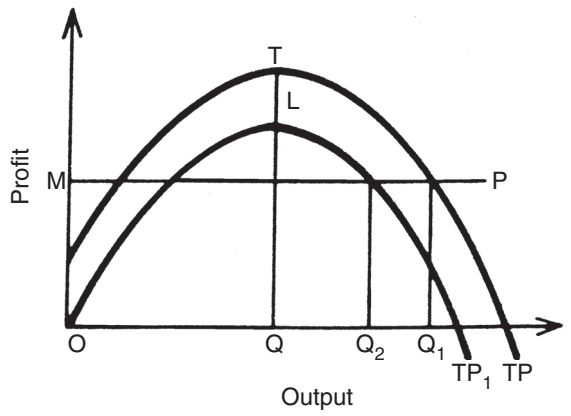
Model with Fixed Costs— The sales maximization firm of **Baumol** is more real than profit maximization firm because it is affected by changes in fixed costs, which is really found in industrial firms. Neo-classic profit maximization theory indicates that the production does not affect by fixed cost in short run. For example, there is no effect on production and pricing if there is a lumpsum tax in this type of firm. But **Baumol** says that if the fixed cost increases in short run due to lumpsum tax then the sales maximization firm will high their product price and low their production. It is described in Fig. 19.6 where TP is total profit curve of firm. MP is minimum profit constraint line which indicates that the firm should get OM profit by selling OQ_1 production.

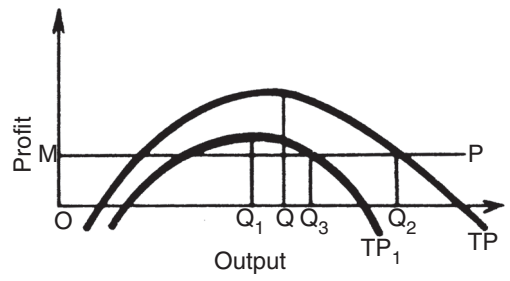
Fig. 3.6



Suppose the government fix taxes are equal to LT by which its profit curve goes from TP to TP_1 and firm will lower their production from OQ_1 to OQ_2. Firm will increase the price of product and transfer the taxes to consumers. But due to lumpsum tax, the profit maximization production OQ does not change even the fixed cost increases.

On the other hand, after adding a specific tax like sales tax, the profit curve will slope downward left, as shown in Fig. 3.7. On the given profit constraint line MP, the sales maximization firm will slow their production from OQ_2 to OQ_3. It will increase the price and transfer the taxes to consumer. The profit maximization firm will also lower their production from OQ to OQ_1 and will increase the product pricing. But the production loss of sales maximization firm will high than profit maximization firm, $Q_1Q_2 > QQ_1$.

Fig. 3.7



Notes

Self Assessment

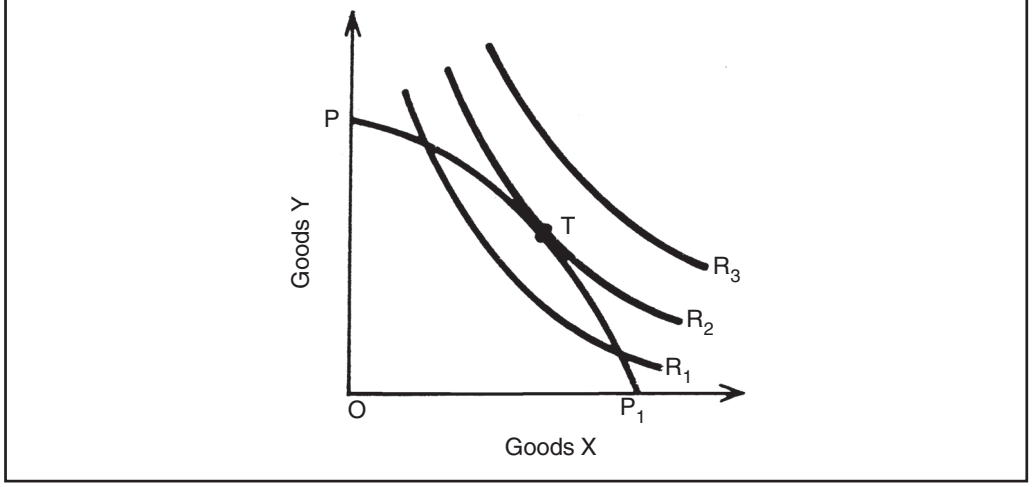
State whether the following statements are True/False:

7. The sales maximization firm of **Baumol** is more real than profit maximization firm.
8. Neo-classic profit maximization theory indicates that the production does not affect by fixed cost in short run.
9. **Baumol** has described that the sales maximization firm can prevent from useful export and import by producing multiproduct.
10. According to **Baumol**, the sale maximization firm will use the difference between the highest level and the lowest level of profit for increasing its revenue.

Model with Multiproducts—Baumol has described that the sales maximization firm can be prevented from useful export and import by producing multiproducts. It is shown in Fig. 3.8 where product X is on horizontal axis and product Y is on vertical axis. PP_1 curve indicates all combinations of X and Y which can be produced by a fixed expenditure or total cost. Curves R_1, R_2 and R_3 are equal which give equal revenue by all combinations of product X and Y. PP_1 and R_2 curves touch point T which is profit maximization point. It is revenue maximization point which is situated in highest curve R_3 which matches the expenditure given by PP_1. Thus, both firms get same result when they use similar inputs in equal quantity and fixed in similar way.

According to **Baumol**, the sales maximization firm will use the difference between the highest level and the lowest level of profit for increasing its revenue. He says this difference as 'rejected fund of profit'. "So every time the firm increases the production for increasing its total revenue, then the firm need to use the rejected fund of profit. This rejected fund of profit should distributed in various inputs, markets, inwards etc. that the monetary profit will high. This relationship indicates that sales-maximization of the firm to break even in relatively inputs and issues should avoid touching, whatever the level of total expenditure and total revenue.

Fig. 3.8



Implications or Superiority of the Model

There are some implications of **Baumol's** sales maximization model which makes greater than the profit maximization model of firm.

1. The sales maximization firm gets preference to sale rather than profit. Since it maximizes its revenue when its MR is zero, so it takes low price than profit maximization firm.

Notes

2. The result shows that the sales maximization production will be higher than profit maximization production of firm.
3. On the given minimum profit constraint, the sales maximization firms will expend more revenue on advertisement than profit maximization firms.
4. There can be protest between the price determination in long run and short run. If the production cannot increase in short run, can be increased by increasing the price of inputs. But in long run, it is better for sales maximization firm to lower their price to get competitive for a big region of market and get more revenue.

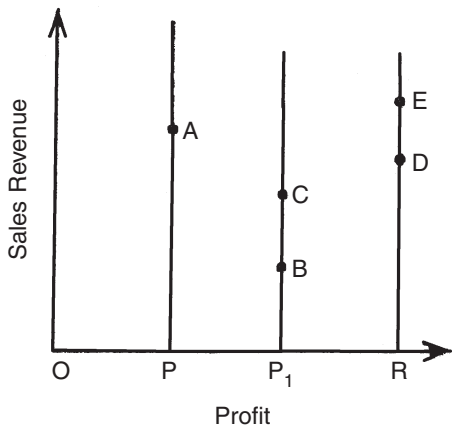
Task Give your views about **Baumol's** Sales Maximization Model.

Its Criticism

There are some criticisms in **Baumol's** Sales Maximization Model.

1. **Rosenberg** has criticized **Baumol** for profit constraint for sales maximum. **Rosenberg** has proved that it is not a easy task to show a firm's profit constraint. It has been shown by some figures of **Rosenberg** in Fig. 3.9. Sales revenue and profit of the firm have taken on the vertical axis and parallel axis respectively. R is profit constraint. Below this, there can be select any one combination. For example, the profit level P_1 on B will give more preference than P on A. Again, in a single profit line P_1, on combination B and C, C will give more preference than B because there are more sales on C. Thus, on constraint line R, at point D and E, E will be given more preference than D which is more sales level. So, in **Baumol's** model, selecting the profit combination of profit maximization is very tough. The advertisement cost will implement till profit get constraint.

Fig. 3.9



2. According to **Shepherd**, an oligopoly firm needs to face kinked demand curve. If the kinked is very big then total revenue and profit will be maximum on a level only. So, the sales maximization and profit maximization firm will not produce the various level of production. But **Hawkins** has indicated that if there is any non-price competition like goods packing, free service, advertisement etc. occurs

Notes

then **Shepherd's** decision gets unrecognized. For example, when sales maximization expends more in advertisement, then its production profit will be more than profit maximization firm. This is so because the kinked profit of demand curve of sales maximization firm is on right side of the profit maximization firm's kink.

3. **Hawkins** has shown that generally a sales maximization firm will produce more and expend more in advertisement than a profit maximization firm, is not real. According to **Hawkins**, a sales maximization firm can select more, less or equal production and more, less and equal advertising budget. This depends upon the responsiveness of demand rather than pricing. This conclusion is for production of a product or a group of product.
4. For multiple products, **Baumol** defends that the result of revenue and profit maximization are same. But **Williamson** has shown that the result of sales maximization differs from profit maximization.
5. Another defect of **Baumol's** model is that it ignores the dependencies of pricing of oligopolistic firms.
6. According to **Koutsoyiannis**, this model of **Baumol** is not capable to rectify market conditions, where price is in non-elastic demand range for long time.
7. This model also ignores not only the real competition but also the expected competition from oligopolistic firms.
8. Again, according to **Koutsoyiannis**, model does not show that how an industry, in which all firms are sales maximized, will get equilibrium. **Baumol** has not made relation between firm and industry.

Despite these deawbacks, it can be said that sales maximization is the main purpose of modern economical firms.

3.3 Summary

- According to **Baumol**, the sale maximization firm will use the difference between the highest level and the lowest level of profit for increasing its revenue. He says this difference as 'rejected fund of profit'. "So every time the firm increases the production for increasing its total revenue, then the firm should need to use the rejected fund of profit. This rejected fund of profit should distribute in between various inputs, markets, inwards etc. that the monetary profit will be high. This relation indicates that in sales maximization firm, the unprofitable inward and outwards should prevent, whatever total expenditure and total revenue range is."

3.4 Keywords

- **Steady State:** Developed State
- **Non-Collusive:** Without Collusive
- **Profit Constraint:** Gag in Profit

3.5 Review Questions

1. `What do you mean by Growth maximization theory of **Marris**?
2. Write comments on **Baumol's** Sales Maximization Model.
3. Explain the model with Fixed Cost.
4. Explain the implications of **Baumol's** model.

Notes

Answers: Self Assessment

1. Dependency	2. Cost	3. Diversification	4. (a)
5. (a)	6. (b)	7. True	8. True
9. False	10. True		

3.6 Further Readings

Books

1. **Microeconomics** — *Robert S. Predik, Daniel L. Robinfield and Prem L. Mehta, Pearson Education, 2009, PBK, 7th Edition.*
2. **Microeconomics — Behaviour, Institutions and Evolutions:** *Sampool Bowels, Oxford University Press, 2004.*
3. **Microeconomics** — *Shipra Mukhopadhyay, Annie Books, 2011.*

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Unit-4: Macroeconomic Theories of Distribution

CONTENTS

Objectives

Introduction

4.1 Ricardo's Revenue Distribution Theory

4.2 Marxist Theory of Revenue Distribution

4.3 Summary

4.4 Keywords

4.5 Review Questions

4.6 Further Readings

Objectives

After studying this unit, students will be able to:

- Know **Ricardo's** Revenue Distribution Theory.
- Know **Marxist** Theory of Revenue Distribution.

Introduction

Total part of different sources of production of total national production of a country is calculated by Macroeconomic Theories of Distribution. In other words, under Macroeconomic Theories of Distribution groups of sources of production of total part have been calculated. Following are the Macroeconomic Theories of Distribution.

4.1 Ricardo's Revenue Distribution Theory

Revenue distribution theory established by **Ricardo** is an important macro theory. In this theory, whole economic system has been distributed in a group of agriculture and industry and income received through it is divided into a group revenue, wages and profit.

Notes Revenue distribution theory established by **Ricardo** is an important macro theory.

Notes

Assumptions of Theory

(*i*) Whole land is used for production of cereal and working powers engage in agriculture fixes the distribution in industry.

(*ii*) The rule of decrease of production on land is regulated.

(*iii*) Supply on land is unchangeable

(*iv*) Labour and capital can be reduced or increased.

(*v*) Demand of cereals is totally inelastic so rise in price or distribution supply does not affect demand.

(*vi*) Wages are given to labours according to their standard of living.

(*vii*) There is nothing progress in technical knowledge and art of agriculture.

(*viii*) Rate of wages is constant and already fixed.

(*ix*) Demand of labour depends on quantity of capital deposit.

(*x*) There is totally competition in market.

(*xi*) Both demand of labour and distribution are free from production limit means maximum production limit does not affect demand supply.

Self Assessment

Fill in the blanks:

1. The rule of ..... is applied on production on land.
2. There is totally ..... in market.
3. Fulfill on land is ..... .

Analysis of Theory

Ricardo's Revenue Distribution theory is based mainly on two theories which are extra marginal and surplus theory. The marginal theory is used for determination of taxes in national productivity and the excess theory is used to distribution of wages, profit etc. from rest of the production.

The factors of production can be determined if the cereals grow is fixed. The unit of labour is the difference between the average taxes of labour and marginal production it means total taxes are the differences of average production of labour and marginal production x the quantity of labour and capital investment on land. Profit is nothing but marginal production of labour and rate of wages. The wages of labour is determined by labour capital x number of labour. Thus the first owner of this production of cereals is landlord and later comes labour and others.

By given figure, we can clarify taxes, cost profit or portion of national production.

In this figure on x-axis labour work and land and on y-axis agriculture production are shown. AP and MP are respectively average labour and productivity curve. Suppose that OM labour is used in agriculture then maximum production of labour is MP and average production MD is the difference in maximum and average production in labour to PD and total

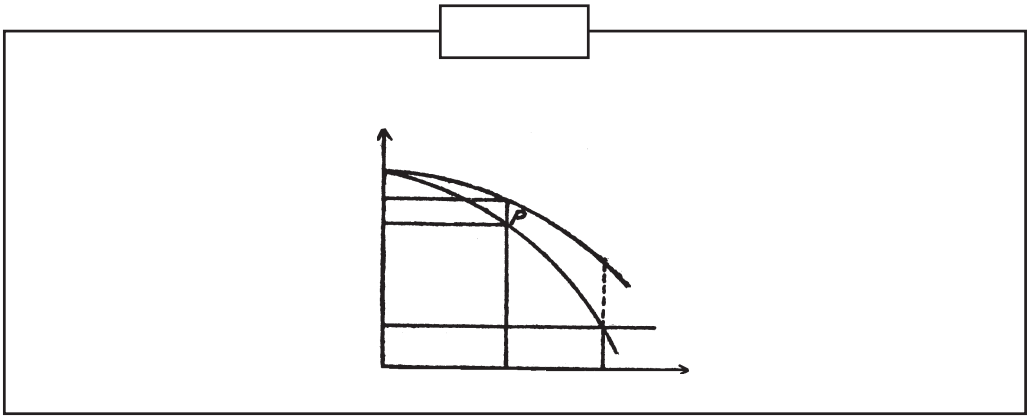
Production = OMDC

Its tax = CD + PB = CDPB

Wages = OM + KW = OWKM

Profit = BP + KW = BPKW

Notes



Self Assessment

Multiple choice questions:

4. For the determination of tax part in national production ..... is used.
   (a) maximum theory (b) investment curve
   (c) distribution theory (d) none of these
5. **Ricardo's** Revenue Distribution theory is mainly based on additional land and ..... .
   (a) special theory (b) half theory
   (c) theory (d) none of these
6. ..... Found in market.
   (a) Perfect Competition (b) Competition
   (c) Utility (d) None of these

Ricardo in his theory found that profit is special income that means profit is that which remains after paid tax, labour cost and interest in total production.

According to **Ricardo**

$$\text{Rate of Profit (Y)} = \frac{\text{Profit}}{\text{Labour Cost}}$$

$$= \left(\frac{MP - MK}{MR}\right) \times 100$$

$$= \left(\frac{PM}{MK} - \frac{MK}{MK}\right) \times 100$$

$$= \left(\frac{MP}{MK} - 1\right) \times 100$$

Self Assessment

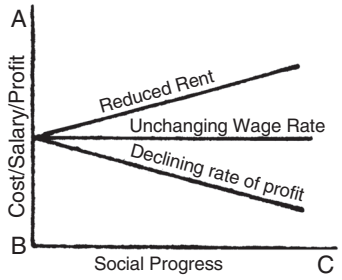
State whether the following statements are True/False:

7. **Ricardo** in his theory found that profit is special income.
8. Demand of labour and supply both are not free from marginal production.
9. The marginal production of labour does not have any influence in demand and supply.
10. **Marx** was rigid socialist in his time.

Notes

Since MK, which is rate of labour cost of life, is unchangeable, so as cereal the rate of profit is changed with the marginal production. According to **Ricardo**, taxes increase with the progress of society and profit decreases, but the rate of real labour cost should be unchangeable. This is clarified by below diagram—

Fig. 4.2



Profit is essential for capital deposit. If profit is not sufficient in quantity; it affects adversely and stops the development of economy. When the rate of profit becomes zero then the capital deposit would stop and economical situation will go to that level which **Ricardo** described as the long run stable period. The main properties of this period are— (*i*) rate of progress will be zero, (*ii*) profit will not happen or it is zero, (*iii*) taxes would be more and rate would be high (*iv*) The cost of labour would be stable in the level of life standard.

Did u know? **Ricardo's** theory is based on the population theory of **Malthus** and productivity loss theory.

Criticism of Ricardo's Theory

(*i*) **Unnecessary Importance to Revenue: Ricardo** has given more importance to taxes rather than wages, interest, profit etc. But it is necessary because every factor gets credit as per their part of services.

(*ii*) **Capital and Labour is not Constant Multiplication: Ricardo** has accepted capital and labour as constant multiplication while this is free factor, not constant.

(*iii*) **Other possible uses of land:** It is not correct that land can be used only for production of cereal but it can also be used for building construction, establishment of industry.

(*iv*) **To add Interest in Profit is Incorrect:** In this theory, interest is also added in profit which is not correct.

(*v*) **Based on False Assumption:** Theory of **Ricardo** is based on the utilization of theory of population and theory of production loss, but the reality is both the theories are unreal.

Task Express views on **Ricardo's** theory.

Notes

4.2 Marxist Theory of Revenue Distribution

Marx was a rigid socialist in his time. The theory of distribution of income established by him is based on theory of price-wages. **Marx** voted that the price of every product is based on quantity of labour. One important characteristics of labour is that it produces more than of minimum standard and he has given wages equal to minimum standard of life and difference between these two has been kept in the form of profit by landlord.

The total cost of production has following factors—

(*i*) Constant Capital—Raw material and means of production.

(*ii*) Changeable Stock of Capital—Wages.

(*iii*) High Price—Maximum earning by labour.

Thus,

Total price of production = constant capital + changeable capital + Surplus

According to **Marx**, in capitalist economic system the exploitation of labour can be increased as following—

(*i*) By increasing working hour of labour.

(*ii*) By maximum use of labour.

(*iii*) By technically development.

In a capitalist economic system, the parts of profit in national income have increased as technology updates and the parts of wages decrease.

Criticism

(*i*) **Maxist** theory of revenue distribution is unsatisfactory and incomplete.

(*ii*) This theory is based on unreal assumptions.

(*iii*) In this theory, variable capital has given more value.

(*iv*) By law of internal structural, it cannot defect the law of rate of decreasing profit.

4.3 Summary

- Revenue distribution theory established by **Ricardo** is an important macro theory. In this theory, whole economic system has been distributed in a group of agriculture and industry and income received through is divided into a group revenue, wages and profit.

4.4 Keywords

- **Marxist:** Follower of **Marx**.
- **Revenue:** Tax.

4.5 Review Questions

1. What is **Ricardo's** revenue distribution theory? Clarify it?
2. Define **Marxist** theory of revenue distribution.

Notes

Answers: Self Assessment

1. Decline	2. Competition	3. Unchangeable	4. (a)
5. (b)	6. (a)	7. True	8. False
9. True	10. True		

4.6 Further Readings

Books

1. **Microeconomics** — *Frank Cowbell, Oxford University Press, 2007.*
2. **Microeconomics** — *Robert S. Predik, Daniel L. Robinfield and Prem L. Mehta, Pearson Education, 2009, PBK, 7th edition.*
3. **Microeconomics** — *David Besenco and Ronald Brutigame, Wiley India, 2011, PBK, 4th Edition.*

Notes

Unit-5: Macro Theories of Ricardo, Marx and Kailki

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Introduction

5.1 Kolder's Total Revenue Distribution Theory

5.2 Revenue Distribution's New Prominent Theory

5.3 Kailki's Distribution Theory

5.4 Vintrob's Theory

5.5 Summary

5.6 Keywords

5.7 Review Questions

5.8 Further Readings

Objectives

After studying this unit, the students will be able to:

- Understand **Kolder's** total Revenue distribution theory.
- Discuss Revenue Distribution's New Prominent Theory.
- Explain **Kailki's** distribution theory.
- Know **Vintrob's** theory.

Introduction

Many economists have given their own in relation to distribution of revenue after **Ricardo**. These economists established marginal production as the base of distribution. New prominent economists have not established a prompt theory for collective distribution.

5.1 Kolder's Total Revenue Distribution Theory

Prof. Kolder established himself a theory of total distribution of income in which he used Kensian apparatus so he called it as "Kensian Theory." According to him, the total income is earned by both – labour and owner. The returns of first group is called 'wages' and second group is called 'profit.' In wages, salary and bonus are counted and in profit, interest and revenue are counted.

Notes

Recognition of Theory

(*i*) Perfect employment condition is available in economic system.

(*ii*) In total income, total wages and total profit are mixed.

(*iii*) The marginal consumption nature or saving nature is constant for labour group and owner group.

(*iv*) The nature of saving is less found in labour class rather than owner group.

(*v*) Additions of saving of labour and saving of owner are called Total Savings.

Notes The returns of first group is called 'wages' and second group is called 'profit.' In wages, salary and bonus are counted and in profit, interest and revenue are counted.

Algebraic Explanation of Theory

Suppose that total national income is A, total wages income is B and total profit income is indicated as C, then we can say,

$$A = B + C \qquad ...(i)$$

That means, national income is called the addition of total wages and total profit. The conception of Perfect Employment is that investment which is always equal to savings. In algebra—

$$I = S \qquad ...(ii)$$

Total savings of society will be the total addition of total wages and total profit. If savings from income of wages SB and savings SC are done due to profit income then

$$S = SB + SC \qquad ...(iii)$$

SB is used for average mentality to savings of wages and SC is the savings of getting profit earlier established in investment.

$$SB = SB \times B$$

$$SC = SC \times C$$

From equation (*ii*) and (*iii*), we get the following—

$$I = SC \times C + SB \times B$$

From (*i*) we have

$$B = A - C$$

Therefore

$$I = SC \times C + SB (A - C)$$

$$I = SC \times C + SB \times A - SB \times C$$

$$I = (SC - SB) C + SB \times A$$

Dividing both sides by A

$$\frac{1}{A} = (SC - SB) \frac{C}{A} + SB$$

Notes

Now, if we divide both sides by (SC – SB) then the equation is

$$\frac{1}{A}\cdot\frac{1}{SC-SB}=\frac{C}{A}+\frac{SB}{SC-SB}$$

Since, C is the symbol of profit and A is the symbol of national income. So, we can say that

$$\frac{C}{A}=\frac{1}{SC-SB}\times\frac{1}{A}-\frac{SB}{SC-SB}$$

Since the price of SC is fixed in the equation, so the ratio of national income (C/A) depends upon the profit of rational income 1/A. So as the rate of investment increases, the profit portion in national income would increase and the wages would be low.

Self Assessment

Fill in the blanks:

1. In economic system, perfect employment condition is ..... .
2. In total income, total wages and total ..... are mixed.
3. The addition of savings of wages and profit is called ..... .

That condition in which conclusion is not get true:

(*i*) Real wages should be the rate of a fixed life standard wages.

(*ii*) There should be a settlement between incomplete competition and traders.

(*iii*) The capital product should be affected by the rate of profit.

(*iv*) Total profit does not below minimum rate.

Criticism of Theory

(*i*) **Kolder's** total revenue distribution theory is based on unreal assumption.

(*ii*) It is wrong to fix the perfect employment and level of production.

(*iii*) Appropriation is not free from average savings and the nature of savings.

Did u know? The total profit of society will be the addition of wages and profits.

5.2 Revenue Distribution's New Prominent Theory

After **Ricardo,** many economists have explained distribution of income. These economists have accepted marginal production as the mail base of distribution. New prominent economists do not establish any solid theory of distribution. Every prominent thought is established only by production equation of **Cobb** and **Douglass**. From the production equation of **Cobb** and **Douglass,** it is clear that how the portion of labour is unstable since 100 years.

J. E. Meed of Cambridge University has accepted the following assumptions by re-establishing this theory:

(*i*) The rule of constant result is followed in production.

(*ii*) Free and limited economical system.

(*iii*) The result of every factor is equal to its marginal production.

(*iv*) The factors of production have perfect employment status. **Notes**

(*v*) Technical knowledge rises by the time and it increases the marginal production.

Self Assessment

Multiple choice questions:

4. After **Ricardo,** relation of distribution of the income discussed by ..... .
   (a) many economists (b) socialists (c) astronomers (d) none of these
5. New prominent economists do not ..... in relation to collective distribution.
   (a) establish (b) praise (c) improvement (d) none of these
6. By the production result of **Cobb** and **Douglass** establishes total new prominent —
   (a) men (b) thinking (c) theories (d) none of these

Explanation of Theory

According to **Prof. Meed,** there are three factors of production—(*i*) capital, (*ii*) Labour and (*iii*) Land. Corresponding portion of the means of production, nature and rate of technical development and establishment elasticity means of production depend on these two things.

Criticisms

(*i*) Theory of **Prof. Meed** depends upon unreal assumptions.

(*ii*) Result of Factors is not given on the basis of marginal production because the demand of marginal theory is not possible.

(*iii*) Meed has accepted factors as variable in his theory but to do this is not a easy task.

Task Express your views in **Kolder's** Total Revenue Distribution Theory.

5.3 Kailki's Distribution Theory

Kailki's Distribution Theory is based on monopoly power theory of Learner. Monopoly power means how it is independent for price evaluation. Total powerful monopoly can fix the price of his production. Total monopoly is just a delusion as Perfect Competition. The thought of **Prof. Kalki** is that the portion of wages in national income is fixed by monopoly power. As monopoly power increases, the profit increases and wages decreases but the price of raw material remains stable. In contrast if the price of raw material increases then the portion of wages increases.

Self Assessment

State whether the following statements are True/False:

7. The factors of production get perfect employment.
8. The constant returns theory occurs in production.

Notes

9. According to Prof. Meed, there are three factors of production— (*i*) Capital (*ii*) Labour (*iii*) Land.
10. Kailki's theory is based on monopoly power theory of Learner.

5.4 Vintrob's Theory

The thought of Vintrob is important in Macro Distribution Theory. According to Vintrob, the total supply curve indicates the relation on the basis of employment. Following are the receiving money— (*i*) Total Wages, (*ii*) Total Constant Expenditure and (*iii*) Residue or Profit.

5.5 Summary

- After Ricardo, many economists have given their thoughts on the distribution of income. These economists accepted marginal production as the main base of distribution. New prominent economists do not establish any solid theory of distribution. Every prominent thought is established only by production equation of Cobb and Douglass. By the production equation of Cobb and Douglass, it is clear that how the portion of labour has been unstable since 100 years.

5.6 Keywords

- **Revenue Distribution:** Distribution of Income
- **Wages:** Salary

5.7 Review Questions

1. What do you mean by Kolder's Total Revenue Distribution Theory?
2. Write Distribution Theory of Kailki.

Answers: Self Assessment

1.	Contained	2.	Profit	3.	Total Savings	4.	(a)
5.	(a)	6.	(b)	7.	True	8.	True
9.	True	10.	True				

5.8 Further Readings

Books

1. **Microeconomics—** *Shipra Mukhopadhyay, Annie Books, 2011.*
2. **Microeconomics: An Advanced Treaties—** *S.P.S. Chauhan, PHI Learning.*
3. **Microeconomics: Behaviour, Institutions and Evolutions—** *Sampool Bowels, Oxford University Press, 2004.*

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Unit-6: Marginal Conditions of Paretian Optimum

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6.1 The Optimum Condition of Exchange

6.2 The Optimum Condition of Factor Substitution

6.3 The Condition of Optimum Degree of Specialization

6.4 The Condition of Optimum Factor Product Utilization

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6.6 The Optimum Condition for Intensity of Factor Use

6.7 The Optimum Intertemporal Condition

6.8 Summary

6.9 Keywords

6.10 Review Questions

6.11 Further Readings

Objectives

After studying this unit, the students will be able to:

- Know the optimum condition of exchange.
- Understand the condition of optimum degree of specialization.
- Explain the condition of optimum factor product utilization.
- Know the optimum intertemporal condition.

Introduction

Most economists accede to that in the form of welfare standard and social welfare the practice of re-establishment has proved as a vain attempt. So prominent lecturers of modern welfare economic such as **Hicks, Learner, Lange** and others in the sense of **Pareto** have established some optimum conditions of welfare. According to **pareto** optimum, Social welfare is maximum on that time, When it is impossible to made better the condition of any power without bringing out from bad condition of other people. **Hicks** has fixed maximum condition to know social optimum of **Parato** which relates

Notes

to production of goods and services, uses and distribution. We show the maximum condition of prof. Rader with the help of figure.

Their Assumptions—Condition of first order depends on following assumptions—

(*i*) That all people are free to choose among different models and do not depend on anything while their ordinal uses of result has given;

(*ii*) That each production unit has freed to others;

(*iii*) That it is given result to each production i.e technical knowledge has constant;

(*iv*) That all means is used for production of each goods;

(*v*) That each object is divisible;

(*vi*) That all people by some quantity of each object;

(*vii*) That each firm has tried to minimize their investment of production and maximize their production.

(*viii*) That it is fully active the means of production of welfare optimum is being now describe.

Self Assessment

Fill in the blanks:

1. Each production unit has ..... others.
2. Each goods has ..... .
3. Means of production is totally ..... .
4. In production of each objects, all ..... has been used.

6.1 The Optimum Condition of Exchange

"The maximum rate of substitution or any two objects for each person should be equal. Which is he used." It means that maximum rate of substitution (MRS) of any two consumer products must be equal the ratio of their price. MRS is slope of any point of curve which indicates one object. Suppose that quantity is X which a person to remain on that curve is necessary to substitute each unit of Y.

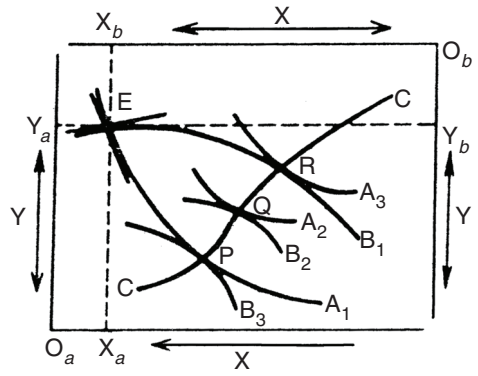
Figure 6.1 shows the optimum condition of exchange. Take A and B are two persons who have constant quantity of objects X and Y respectively. O_a is the main point of consumers and O_b is the main point of B. (See Fig. 6.1) Both axes of O_a and O_b indicate vertical side of object Y and horizontal side of X. A_1, A_2 and A_3 indicate neutral map of A and B_1, B_2 and B_3 show neutral map of B. Any point of this point shows possible distribution between both person and object. Take point E, Where A_1 and B_1 curve cut themselves. On this condition, O_a Y_a units of Y with A and O_a X_a units with X. O_b Y_b units of Y get B and O_b X_b units get X. On point E, the rate of substitution between both objects, is not in equal ratio with their prices because the slope of both curves is not equal. So between two people A and B, with two objects X and Y on point E is not the optimum condition of exchange. Let us try to find such a type of point, where the condition of a person is better than before while the condition of others would become worsen as before.

Suppose that A wants to take more objects of X and B wants to take more objects of Y. The condition of each would be better and condition of others would not become worsen under high neutral curve. Suppose that they come from point E to point R. On point R, A gets more X quantity after living some quantity of Y while B gets more quantities of Y after coming some quantities on X. The condition of B is not better because he lies at that neutral point but the condition of A on R is better because he arrives from A_1 to A_3 respectively high neutral point. But if A and B would come from E to P that the condition

Notes

of A is as before because he lies on that neutral point A_1. The condition of B becomes better because he goes from B_1 to B_3. Only that time when both would come on high neutral curves, when they come from E to Q.

Fig. 6.1



Therefore, P, Q and R are three points of exchange. Contract curve (CC) is the route of these touch-points which indicate different situations of exchange which keep equality in the rate of maximum rate of substitutions of X and Y. So on CC curve any point satisfies optimum condition of exchange. But as CC progresses in any direction, one person became better investment of others. Therefore, in the sense of Pareto, CC curve indicates optimum social welfare, but most social welfare, the real optimum points leave constant. If on the point Q of CC curve both reconsits, then this is the point of **maximum Social welfare**. But there is a fixd price. Obviously, according to **Prof. Bolding,** "In this assumption optimum point should be placed on CC curve. It is an important decision that what people want, they must get. If fixed price would accept then non-optimum point of pareto, like E, can be considered as this condition of maximum social welfare.

Notes Each person should have equal maximum rate of substitution or any two objects which he uses.

6.2 The Optimum Condition of Factor Substitution

The condition which relates to optimum supply demands that for any two such firms, between any two factors rate of technical substitution, should be equal by which for the production of that object these two factors are used. On the point of equal quantity of curve maximum rate of technical substitution to keep the standard production place of one other uses in the rate of substitution. This is shown in Fig. 6.1 above where we suppose X and Y are the two means and A and B are the two firms. Suppose A_1, A_2 and A_3 are the isopuants of firms A and B_1, B_2 and B_3 are the isopuants of firm B. The slope of isopuants indicates between X and Y is MRTS. Suppose that on point E, initial production is contracted. On this stage, there are A_1 units of object, firm A uses $O_a X_a$ of X and $O_a Y_a$ of Y. Likewise for production of units of B_1 of that object, firm B uses units $O_b X_b$ and $O_b y_b$ of X. But the maximum rate of technical substitution between both factors is not equal. By the movement of touching point between disputants the optimum condition of factor substitution is completed. CC line indicates the route of touching lines of P, Q and R. Therefore, CC curve at any point of CC curve will use the optimum of each factor'.

Notes

Then with CC curve, in one of the directions, production of a firm can be caused for the increment of the cost of the other firm. So, the condition indicates that any factor used for any function that will be efficient.

Self Assessment

Multiple choice questions:

5. Hicks has fixed to know the optimum of pareto ..... .
   (a) maximum condition (b) monies (c) arts (d) none of these
6. The factor of production is totally ..... .
   (a) active (b) motion (c) efficient (d) none of these
7. Each objects has .....
   (a) divisible (b) remainder (c) non-divisible (d) none of these
8. Each production unit with others is .....
   (a) not free (b) constant (c) free (d) none of these

6.3 The Condition of Optimum Degree of Specialization

It is necessary for the condition of optimum degree of specialisation that "For any two firms producing any two objects the maximum rate of transformation between those two objects is equal." Maximum rate of transformation (MRT) is that rate on which the object has to leave so that on that quantity of objects maximum quantity other objects would be produced. This is measured by slope of transformation curve of any point in the figure. This condition is accepted that time, when production would be done of two objects in such a condition so that the slope of transformation is equal.

To prove this, suppose that in Figs. 6.2 (A) and (B), TA is transformation curve of firm A and PB is the transformation curve of firm B. On production possibility curve, each point of two objects, maximum possibility quantity indicates at a time. Because it is concave on main point. So, this means that for maximum production of an object maximum quantity of other objects would be left.

Fig. 6.2

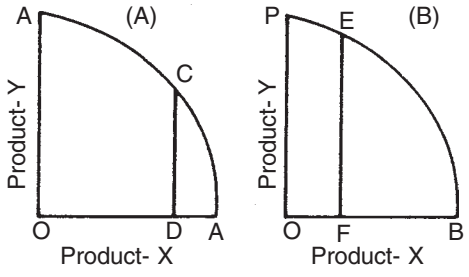
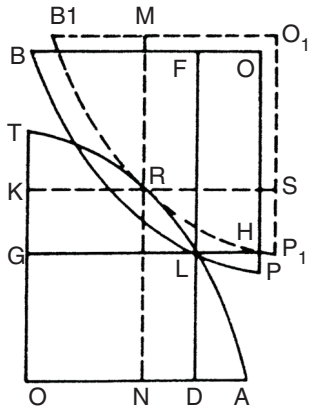


Fig. 6.3



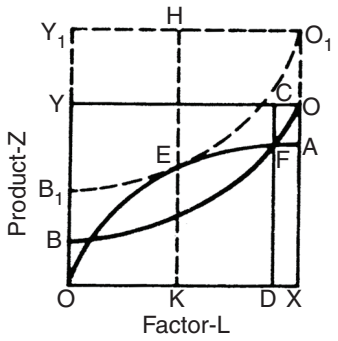
Notes

Suppose that firm A produces OD quantity of object X and DC quantity of object Y and firm B produces OF quantity of X and FE quantity of Y. Both firms produce total quantity equal to OD + OF and DC + FE of X and Y respective. Fig. 6.2 (B) keeps above 6.2 A show total quantity of X and Y in Fig. 6.3. These quantities are GH and FD respectively. Because transfer curve TA and PB cut on point L each others. So, the maximum rate of production is not equal. So, L is not the optimum point of condition because both curves are not touch point each other. But if we lift the given figure little which is shown by dash so its transferable curve P_1 B_1 touches TA on R_1 So the slope of both curves meet each other. This condition is accepted because maximum rate of transformation of both objects on point R is equal. This is the condition of optimum degree of specialization because total quantity produces by them is X KS > GH and MN > FD total amount of Y. It is not matter that R is the only optimum point of production for both firms. Obviously, these can be many series of this condition of optimum where both transfer curves can touch each other.

6.4 The Condition of Optimum Factor Product Utilization

In this condition, "between any factor and any object there should be equal transformation maximum rate which uses that factor and produces that object.' It means that for the production of a special object, maximum rate of any factor for all firms should be equal. If maximum productivity of a factor is less to produce an object, then some units of factors transferring to more producing firm would increase total production. It has been clarified with the help of Fig. 6.4. Suppose that firm A has transferring curve if OA and Firm B has transferring curve OB which has kept opposite on the transferring curve so that axes are in parallel. Obviously, these are total producing curves and the slope has indicated the maximum rate to change of a object of factor. Product (z) produced by two firms is taken on perpendicular axis and their production is taken on horizontal axis. The point where both the transfering curve cut each other is not the point of optimum condition. To get optimum condition push curve OB upper side, so the point E touches OA curve. It is the point of optimum factor product utilization because OA and O_1 B_1 slope of both transferring curves are equal and quantity of object increases from DC to KH.

Fig. 6.4



Did u know? For two firms producing any two objects, the maximum rate of transformation is equal.

Notes

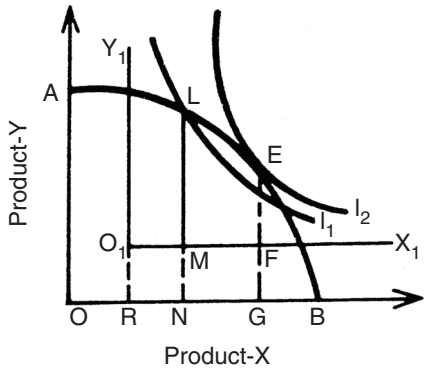
6.5 The Optimum Condition of Product Substitution

It is necessary for the optimum condition of product substitute that for any person who uses any two objects (for society) transferring rate is equal to conversion transferring rate. It means that maximum rate of transferring is equal to maximum rate of any two objects. It is shown in Fig. 6.5. Suppose that curve a AB is the community transformation curve between two objects X and Y. In this figure considering O_1X_1 and O_1Y_1 are two axes, two objects personal conusmers' neutral curves I_1 and I_2 are shown.

Suppose that production occurs on L where X produces ON quantity and Y produces NL quantity and consumer buys O_1M of X and ML of Y. But L is not the optimum point because the MRT is not equal to MRS on it. AB and I_1 curves do not touch each other. Change from E to L and make AB and I_2 curves equal. Thus point E indicates optimum condition for both producer and consumer because MRS = MRT. It means that rate on which producer is to ready to keep replacing of products X and Y equal to that rate by which X can change to Y.

According to the figure, when the consumer comes above the neutral cruve I_2 which at point E is the tangentias to transfering curve then, from the quantity OG of X and GE of Y produced by society, consumer consumes O_1 F of X and FE of Y. The last quantity OB of Y and GE of Y is remained for the cosumers of the rest of the society.

Fig. 6.5

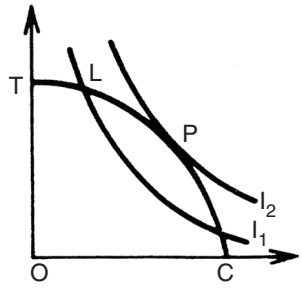


6.6 The Optimum Condition for Intensity of Factor Use

In the given period, the relation of a factor relates to its optimum distribution. For this, it is necessary that the transferring rate between wages of works and substitution maximum rate hour of works and maximum rate of transferring should be equal. On given period, one would feel problem to choose kindly and uses. If he uses holiday then he earns less. In reverse due to the relation between income and holiday so it has a neutral map which indicates different parts. Neutral curve indicates maximum rate of substitution between holiday and income. Likewise, factor unit object of each owner and factor unit helping in production, we consider time is a transferring curve. For this condition work and holiday the maximum of substitution, maximum rate of transformation between work and object is should be equal. If between work and holiday rate of maximum substitution work and object is greater than maximum rate 0, so time unit of factor unit transferring curves for holiday, production can be increased. Optimal condition comes on that times when the prize factor should be paid to owner factor is equal to the value of marginal productivity. It has cleared with the help of Fig. 6.6.

Notes

Fig. 6.6



TC is transformation curve of work and production. Supposing C as a zero point of factor, factor units on parallel axis from right to left have measured horizontally. Production unit has measured vertically. So, TC curve indicates transformation between decreasing maximum rate of work and production. On the other hand, each neutral curve indicates different income with work and holiday. In this condition, income is measured on horizontal axis and holiday in hours is on vertical axis. Convexity of neutral curve indicates decreasing maximum rate of substitutions between income and holiday. This maximum condition accepts on that points where transformed curve and neutral curve both are tangent. That means their slopes are same. It is clear that L point is not point of optimum condition because on this point TC and I_1 intersect each other. Maximum rate of substitution between income and holiday and maximum rate of transformation between work and production are same when a person goes above the neutral curve I_2 where curve I curve TC meet each other point P. In this way this condition is satisfied at point P.

6.7 The Optimum Intertemporal Condition

It is important for this condition that, "The short term maximum rate of transferred between the pair of factors and object and between pair of each factor and between pair of objects, the short term maximum rate of substitutes is equal to interest on hiring without risk of securities." So, in absence of risk and uncertainty, if this condition is related to give or take loan analyzing producer. The meaning proof of this condition is that the rate of interest, on which individual product, quantity of capital is ready to take loan for taking loan producer the capital maximum productions should be equal. It can be cleared with the help of Fig. 6.6. It measures parallel axis in the form of income and vertical axis is in form of buying capability. On separate different time, I_1 and I_2 is neutral curve of time on different income stage with personal loan giver. It indicates decreasing maximum rate of substitution between income of present and future on neutral curve of each point. It means that on that each unit of income of a person wants high premium whose he leave for uses. TC is the time production possibility curve of personal loan. On this concave through time on each point indicates decreasing maximum rate of capital. This condition satisfies that rime when time neutral curve and time product possibility curve tangent to each other. Because both curve cuts each other on L, so this cannot be the point of optimum condition. Point P indicates optimum condition because on this point the slopes are equal on TC and I_2.

Did u know? Give your thought on short-term optimum condition.

Notes

These all conditions can be collected as a whole theory as:' the maximum rate of substitution between any two objects and factors is equal to their maximum rate of transformed and ratio of their price must be equal with each other.

Self Assessment

State whether the following statements are True/False:

9. Maximum rate of transformation is that rate of which object will be quit.
10. Optimum condition comes of that time, when a factor – owner paid price is equal to maximum rate of producing of a factor.
11. Concavity income on neutral curve and decreasing indicates maximum rate of substitution of holiday.
12. Convex transformation curve and concave neutral will indicate economic minimum.

Its Criticisms: These marginal or first order conditions are essential for maximum welfare, but maximum welfare is not sufficient instead it can take to minimum condition in reality. Convex transformation curve and concave neutral curve will express economic minimum. So, for getting maximum welfare it is necessary to fulfill the condition of 1st type with the condition of second type. It is necessary for second type condition that all neutral curve main point should concave and all transformation curve main point should concave. But it cannot be necessary to get maximum condition. According to Prof. Bolding, "there is nothing in marginal condition which differentiates between simple mountain and Everest." So, total welfare condition of Hicks should fulfill. If we use the Bolding statement, it measure moments. It is necessary for total condition that "if welfare is to be maximum, it should impossible whose production is not done. By production of that object and whose uses are not done eluting, it should increase welfare by using that factor". Dr. Mishan is accepts these total condition as a true sufficient condition. Which if agree with maximum and second type condition then it can take to maximum of welfare. But maximum, it can be one optimum condition. Therefore in all conditions price fixation is remaining while optimum maximum condition of Pareto excludes price decision. Obviously, maximum condition is also not free from price decision. Each point on the contract curve fig. 6.1 Pareto optimal choice reflects the value judgments of them are present.

All marginal conditions satisfy in perfect competition. But in fact, these necessities are never fulfills in perfect competition because oligopoly, duopoly and monopolistic competition are found in real world. But the optimum level of Pareto can never found in monopolistic competition because the substitution rate for various consumers will never equal; the MRS will not equal to MRT for different products and factors as well as their ratio of price will never equal. To not satisfy the MRS, the main reason is the prices are always high from its marginal cost in monopoly condition, P > MC = MR by which the factors distributed faulty.

The socialist solution: Since under monopoly competition optimum condition of Pareto does not agree, so it enchased this statement that each Pareto optimum distribution is perfect competition and each candidate equilibrium is Pareto optimum. But Dr. Mishan clarifies that is not necessary or essential condition for obtaining optimum conditions. So the economist like Lang and Lerner have proved that under socialist for getting optimum condition, it is possible to supply prompt supply of resources. If ownership is removed in capitalizes that like capitalism, the condition of socialism can be constructed. In socialist economy planning power take the place of capitalism market and equalize the demand and supply by mixing the price of object and scripting. But distributor wishful to resources by trial and error the price of accounts can be established. Then by ratio of giving instructing to apply maximum law, optimum production and optimum factor can be receiving. When once this is obtained the efficiency of distribution then optimum condition of welfare is totally agree.

Notes

6.8 Summary

- Condition which relates to optimum of factory demands that for and two firms between any two factors maximum rate of technical substitution should be the same, by which for production of that object, this both type of factor is used. On any point of isopuants, the maximum rate of substitution, for production to keep the standard in place of one the rate of other factor of substitution.

6.9 Keywords

- **Exchange:** Change
- **Specialization:** To be special
- **True Sufficient Conditions:** Total conditions

6.10 Review Questions

1. What do you mean by the optimum condition of exchange?
2. What do you mean by the optimum condition of factor substitution?
3. Write a note on the optimum intertemporal condition.
4. Give four the optimum condition of produces substitute.

Answers: Self Assessment

1.	Free	2.	Divisible	3.	Active	4.	Fact
5.	(a)	6.	(b)	7.	(a)	8.	(c)
9.	True	10.	True	11.	True	12.	False

6.11 Further Readings

Books

1. **Microeconomics—** *Shipra Mukhopadhyay, Annie Books, 2011.*
2. **Microeconomics: An Advanced Treatise—** *S. P. S. Chauhan, PHI Learning.*
3. **Microeconomics: Behaviour, Institutions and Evolutions—** *Sampool Bowels, Oxford University Press, 2004.*

Notes

Unit-7: Market Failure: Meaning and Sources

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Objectives

After studying this unit, students will be able to:

- Know the Types of Goods and Services.
- Know the Externalities and Market Failure.
- Understand the Externalities and the Coase Theory.
- Explain the High Transaction Costs.

Introduction

The market failure means the condition of market which is based upon the power of demand and supply does not capable to distribute the factors. The one of the main sources for market failure is

Monopoly Market Structure. How it happens, below are the reasons—

Notes

> *In the words of J. B. Taylor, "Any situation in which the market does not lead to an efficient economic outcome and in which there is potential role of government. There are three broad sources of market failure: Public Goods, Externalities and Market Power."*

The slope of demand curve for monopoly is downward. So the average revenue is more than marginal revenue. The equilibrium condition for a firm is MR = MC. When AR > MR (and MR = MC) then it means the price is more than marginal cost (AR > MC). In this condition, the production is low rather than the production of perfect competition in industry. So in the monopoly condition, however, the profit maximization is fulfilled but the satisfaction does not occur, so the market does not capable to distribute the factors.

Apart from monopoly market structure, there are some other sources of market failure. All other sources are described briefly as follows—

1. When firms work on minimum costs and exhibit the excess capacity. This type of market failure is found in monopoly. In monopolistic competition, the firm does the production on the decreasing segment of LAC, it means less of production than perfect competitive condition.
2. When property rights is not a right exclusively for an individual but an indivisual can use property In this condition, an individual shows his rights on a factor and it shows the maximum uses of that factor.

> **Market Failure Calls Government Help**
>
> *To get good distribution of factors, market failure seeks help from government. The government helps works on following terms –*
>
> *1. To mind on every factors of market failure correction of economical situation.*
>
> *2. To help the individuals from society to accept some standard equities.*
>
> *3. To affect the rate of economical development.*
>
> *4. To give balance to economical situation from income and price related problems.*
>
> *5. To protect and establish the property rights of individuals and couples of society.*

3. When we are not able to differentiate non payers from the profit by using a product. It is generally shown in terms of roads, bridges, law systems etc. These factors are used by everyone, however, they do not pay anything for it.

4. When an economical process affects others but nobody cares about this affect. This is called Externality. It can happen either in production or consumption.

5. When imperfect information is available or information is not true or it does not spread in the market. It can be various changes or its data. Economical agents have limited information. Asymmetric information or imbalanced information is also a source of market failure.

6. When price of a product is diverged from its marginal cost by producer due to monopoly.
7. When market is not available.

Self Assessment

Fill in the blanks:

1. The one of the main sources for market failure is ..... .
2. The slope of demand curve for monopoly is ..... .
3. Market Failure calls ..... .

7.1 Types of Goods and Services

To get detailed information in market failure, it is necessary to get knowledge about different types of products. These types are: **Public Goods**, **Common Property Resources** and **Normal Goods**. The differences between these goods depend upon four main resources and those are—

Notes

(*i*) Rivalrous or Rival Consumption

(*ii*) Non-rivalrous or Non-rival Consumption

(*iii*) Excludable

(*iv*) Non-excludable

(i) **Rivalrous or Rival Consumption:** The consumption of a production seems competitive when the availability of this product gets low for person B if A consumes this. So both persons (A and B) cannot use that product without fulfilling the satisfaction of each other. For example, if Rahul drinks juice, Rohit cannot drink that juice; consumption by one person can exclude others from consuming a product. **So the products (like Apple, Pepsi, Cola, Machine etc.) whose availability affects by consumption of others, is called Rivalrous product.** This is also called Private product.

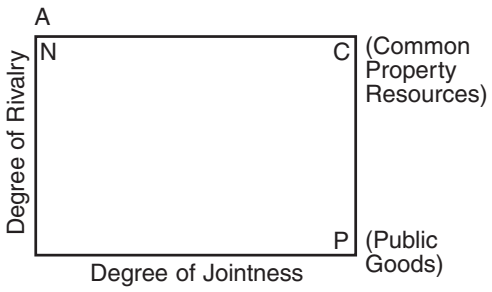
(ii) **Non-rivalrous or Non-rival Consumption:** A product is non-rivalrous if a person (suppose A) consume a product but product does not get out of market. Means the similar unit is available for using more than one person.

Park, National Security, Roads, Bridges, etc. are non rivalrous products. A park, in which everyone comes and goes and takes advantage to get relax. Thus, the persons of a nation can use the security provided by national security system.

(iii) **Excludable:** A product is excludable when non payers cannot be differentiated from it. In other words, when the law of property rights can use as only payers can use this facility. Ramesh eats pizza but this is not available for Raju because Ramesh has ownership on this and he has only ownership to eat pizza. Thus if you have bought a car, you are the owner of car and it is your property right, so no other person can use this car without your permission. By an agreement in property right, these types of products get excluded.

(iv) **Non-excludable:** These are the products for which no person can take rights. Roads, bridges, street lights etc., are those products which cannot be separated to use by property rights because these are the Common Property. Since the street lights are common property so it is difficult to prevent non-payers to use this.

Fig. 7.1



After getting knowledge about competitor, non-competitor, excludable and non-excludable products, we would learn about public goods, common property resources and common goods by the help of Fig. 7.1.

In Fig. 7.1, Degree of Jointness is mapped on horizontal axis and Degree of Rivalry is mapped on vertical axis.

Public Goods have Characteristics of non-excludability and non-rivalry. So we can tell that in it degree of jointness and degree of rivalry have zero quantity. In Fig. 7.1, it has shown in bottom right.

Notes

Common Property Resources have high degree of rivalry but are also non–excludable—This is shown by point C on the top right corner of Fig. 7.1.

Normal Goods are Rival and also Excludable—So it has high quantity degree of rivalry and degree of jointness is low. It has shown by point N on top left corner in Fig. 7.1.

7.2 Excludable Goods and Market Failure

The products produced by independent firms should generally be excluded to get profit maximization. The producer can prevent to use this product to the person who is not paying for it. If they do not do so then they will get revenue loss as well as never get profit maximization.

However, the markets can be failures even after that. Excludability is a necessary condition for market perfection but not a sufficient condition. Goods which are excludable may not be rivalrous. The examples are art galleries, museums, parks with boundaries etc. By using this a person cannot interrupt others. The question is that how can we search efficient pricing system for these products? Various users will pay money as per their satisfaction level for these products.

According to ***Lipsey****, "****Excludability is a necessary condition for goods to be produced by a firm for sale in the market.****"*

Self Assessment

Multiple choice questions:

4. The market failure is the condition which ..... the perfect economical cost.
   (a) available (b) agree (c) disagree (d) none of these
5. Public Goods have ..... of non-excludability and non-rivalry.
   (a) less (b) emotions (c) characteristic (d) none of these
6. Normal Goods are those products which do ..... to both Rival and excludable.
   (a) available (b) permanent (c) temporary (d) none of these
7. The producer can prevent to use this product to the person who is not ..... for that.
   (a) work (b) pay (c) expend (d) none of these
8. 'Other products' are those products which fulfill the excludable characteristics but not the rival ..... .
   (a) condition (b) real (c) characteristic (d) none of these

7.3 Excludable but Non-rivalrous Goods as a Source of Market Failure

We can say the difference between 'normal goods' and 'other goods'. **Normal Goods are Rival and also Excludable.** So these products cannot valid source for market failure. It is possible when producer fulfills the condition of differentiate means they work on that point where AR = MC.

'**Other Products**' are those products which fulfill the excludable conditions without any rivalry conditions. So these products are the source of market failure.

Notes The market failure means the condition of market which is based upon the power of demand and supply.

Notes

7.4 Non–excludable Goods and Market Failure

On the basis of competency, the non-excludable goods are classified into two categories:

(*i*) Common Property Resources

(*ii*) Public goods/products

These are some of the major market failures—

(*i*) Common Property Resources

As shown in Fig. 23.1, The Common Property Resources (CPR) has indicated on the top right side by point C where high degree of jointness and high degree of rivalry have shown. In other words, it shows rivalry and non-excludable products. So for CPR, anyone can use these products and nobody has any rights for it. To catch a fish in sea is an example of CPR. As a person catches fish is affected to another but no one can prevent or stop the other to do so, because to catch a fish in sea is nobody's exclusive right.

For example, the common land of a village has ownerships of every farmer. If a farmer grazes his sheep there, the feed for the other farmer's sheep can decrease. This is called "**Tragedy of Commons**" or can also be called bad episode of commons.

Thus there is unskilled use of common property. It can happen till the destruction of that property.

In CPR condition, market fails to distribute the factors in good way.

> *In the words of* ***Lipsey****, "****The socially optimal allocation of a common property resource occurs when the marginal cost of the last user equals the value of the marginal addition to total output****."*

Socially Optimal Exploitation of CPR—What should the optimal exploitation of CPR? We can understand this by an example. We take example of fishing. It would be socially optimum to get a new boat for fishing if the cost to operate the boat is less than (equal to) the value of total catch by the additional boat.

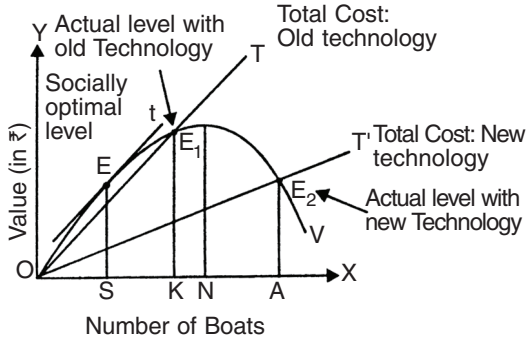
Thus, in common land situation, it would be optimal if there is an increment of one sheep, if the cost of grazing (means the loss of available feed for sheep) is equal to or less than the price of milk or meat.

We have to equate marginal cost of additional user with the value of the marginal addition to total output.

The free markets or perfectly competitive markets do not offer socially optimal solutions—In the example of fishing, to invest in fishing industry or to put a boat in fishing depends upon that what is the cost of typical fishing boat and the cost of running new boat. In independent market, the new experimentalist of CPR increases the market until the marginal cost of last entrants is equal to average production of existing producers. Thus, the excess use of CPR shows its exploitation.

This condition is represented by Fig. 7.2.

Fig. 7.2



Notes

The cost of catch rises in decreased rate until ON boats not put up. After this, if extra boat is used then it shows a decreased rate. Socially, Maximum Level comes when OS boat is used.

When OS boat is used then
T slope of curve = V slope of curve

How is it? Using old technique, the slope of curve V is equal to slope of curve V. It means that marginal profit (represented by V slope of curve as additional catch) is equal to marginal cost (represented by T slope of curve as using additional boat) means by using OS boat, Marginal Benefits = Marginal Cost.

Note that t line is tangent to the V curve and is parallel to the T line

In an independent market economy, the industrialist will stop at point T in fishing? The answer is NO. The reason behind this, they feel that the cost of operating an additional boat is less than expected revenue.

With old technique, fishing will continue till E_1 until OK boats run and with new technique it will continue till E_2 until OA boats run. Every new entrant puts his catch or average product equal to cost of operating an additional boat. But the tragedy is that he does not check his social cost in this industry. The social cost which he is missing is the loss of catch which is given to other fishermen. The reason behind this is the common property fishing is exploiting by E_2 until OA boats are used till the production occurs ahead from negative marginal returns. Thus the level of production (number of boats) will high in common property factor because new entrants will not consider that loss which has given to existing fishermen.

This problem is related to all the fishery ground until the government makes a regulation in fishery.

How can Over-exploitation of CPR be avoided?—The CPR can be avoided or prevented by two methods.

The **first** suggestion is **Optimum Level of Use** and to restrict that level by control. It generally occurs on those conditions like hunting licenses, fishing quota etc. But there are some problems in this suggestion. However, the quantity of fishing can be restricted in sea but there is high cost include in it. If we see the international cases on quota violations then it is very high where these violations are happened after fixing the quota.

Second suggestion is to clarify the property rights and should make as exclusive. One CPR is rival to nature, if there is exclusive property right occurs then it means that CPR has both the characteristics of normal goods (*i*) Non-excludable and (*ii*) Rivalry. It would perfect the factors distribution in independent market situation.

But the perfection and equity has always rival. Generally in common land situation, common property rights is used to improve equity and it is definite in the cost of perfection.

The new question is that what is important–equity or perfection? The second suggestion can use after selecting from this.

(*ii*) Public Goods and Market Failure

The public goods or '**Collective Consumption Goods**' is a main reason for market failure.

The public goods have characteristics of non-rivalry and non-excludability. The examples are security services, law and administration services etc. For these services, no matter who is paying for this but it is available for everyone. So these services are non-excludable. Thus the consumption of these services by one does not affect the consumption of others.

The non - rivalry virtue of public goods market can not be allocated efficiently in the plant system (in this case because the private benefits and private costs society / community get more social benefits). Therefore these objects are provided by the government and managing sources of finance.

Notes

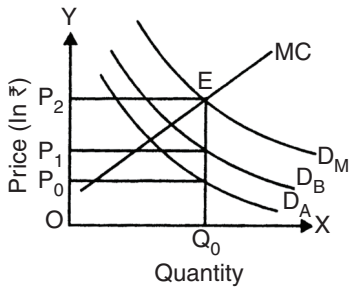
When the public goods should be available and who and what should be paid? Following observations are to be noted—

(i) The public goods should available when the addition of reservation price is equal to more than public goods. **Reserved price is the maximum price which a person is ready to pay for public goods for getting maximum or equal satisfaction**.

Example— The affordability of a television set in a government region of 10 families is public goods. It is non –rivalry and non-excludable. When it should be available or connected? It clarifies that the price which is ready to pay by the residents of that region is equal to or more than the total cost of television.

(ii) How much quantity should public goods be available? In normal goods situation, if a person is using goods, then others cannot use that particular goods. So in a given price, only a fixed production occurs. In other words, in the condition of general goods, horizontal summation of individual demand curve to derive aggregate demand curve and in a particular price, fixed quantity is produced. But as per the relation of public goods, some of the quantity is available for the entire person. So as the given quantity of product, its price should equal to given by every penny of a person.

Fig. 7.3



As shown in Fig. 7.3, a vertical summation for individual demand curve is extracted.

In this diagram, the demand of public goods by two persons A and B has shown as D_A and D_B curve respectively. By vertical summation, we get D_M curve which is the demand of both persons. This demand curve (D_M) describes that how many price is ready to give for a product.

MC curve is marginal cost of public goods and it is also a supply curve.

E is an equilibrium point on which the demand is equal to supply on OP_2 price. The OQ_0 quantity is given for the public goods which is available for both A and B.

The cost of every unit OP_2 is differentiating between both A and B. The person A pays OP_0 and B pays OP_1, so $OP_0 + OP_1$ OP_2.

Thus the optimum quantity is produced as OQ_0 and the cost is equally distributed to its experimentalists.

But it always cannot possible that it happens by the theory of demand-supply equations. To understand this condition that the average quantity of public goods is available for all (because public goods are non-rivalry), but some experimentalists will hide the experiments of these products means they will hide of using these products.

TV in one area. In the previous example with the availability of any user other than it can use its free. in such a situation, object or substance is either not available karya TV. The cost of putting all users it has definitely not been spent for it i.e. suffered did not pay.

The government generally took the cost to get rid of free riders. The government expends the tax revenue rather than any sales revenue.

7.5 Externalities and Market Failure

Notes

The one of the main sources of market failure is externalities. This happens due to the lack of property rights. **By 'Externality' we mean the situation when the costs or benefits related to a transaction not only affects the transactors but also other parties**. This is also called **Third Party Effect**.

According to **McConnel**, "**Externalities occurs when some of the benefits or costs associated with the production or consumption of goods 'spillover' on Third Parties i.e. or parties other than the immediate buyer or seller."**

Example – If any person creates garden in outside of his home and grows various types of beautiful flowers. Now this work will not only give aroma to his neighbour but also the third person who crosses at his house. To grow the garden process is called positive externalities. Nobody will pay for it.

In contrast, if anybody fixes a generator in his house, and starts that after cutting the electricity, however that person gets light but that generator will produce noise pollution and air pollution which **negative externalities** will affect to his neighbor as well as the third party. The generator owner does not give any price for this negative externality. The negative effect bear by neighbour is called negative externality.

If this factor is not included in **decision-making**, then it creates externality and this is the reason of market failure. For example, the pollution from factories affects the health of nearby residents. But this cost cannot add in production cost. This is negative or bad externality.

To describe the externality, it is essential to differentiate the personal cost or profit and social cost or profit.

In any society, the distributions of factors are optimum when social marginal cost is equal to its social marginal benefit.

An independent market distributes factors optimally when the personal cost is equal to social cost and personal profit is equal to social profit. When social cost is more than personal cost then there will negative externality and when social profit is greater than personal profit then there is positive externality.

The Benefits and Cost of Personal and Social

1. ***Private Cost and Benefits:*** *In the process of production, a producer puts factors on process to get some financial award like wages, interest and taxes etc. This is private cost for a producer.* ***Thus the private cost is the cost which a producer bears while producing a product****. When ready product has bought and consumed by consumer and the profit gets from it is called* **private profit**. *This private profit and private cost has distinguished into public/social costs and public/social profits.*

2. ***Social Cost:*** *Whenever any financial process occurs, society has also bear some cost along with an individual or firm (which produces). This social cost is the social cost of financial process for society. In easy words,* ***the social cost is the cost which all societies bear to produce a product****. For example, the cost of vehicle runs on road is the pollution, defects of road and crowd, which is from vehicles.*

3. ***Social Benefits:*** *The social benefits are the benefits which society gets from an individual's financial process. So the society is benefited from an individual's financial work, is called Social Benefits.*

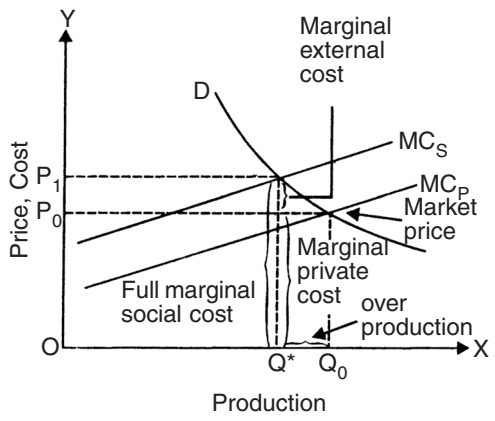
Did u know? Market Failure calls the government interfere.

Notes

7.6 Negative Externality

When a person's consumption or production process is affected to another person in society and he also gets negative impact and he does not get any compensation, then it is called Negative Externalities. For example, if a person established a steel factory near river and draws all pollutants in river. It clarifies that due to this process the fishes get affected. Now the question is that is this effect, the owner of steel factory would include this social cost (loss of fishing production) in his cost of steel production? Definitely not. Figure 23.4 indicates that how negative externalities become a part of market failure.

Fig. 7.4



Since steel firm does not take care of its social cost, so the market price and production determination would occur by marginal cost curve and demand curve. Market equilibrium will be on OP_0 price with OQ_0 production. In this diagram MC_P is private marginal cost. But this does not describe the true cost because it does not include the social cost of steel manufacturer. If social cost is counted then the marginal cost curve will move to marginal external cost. The new cost curve is MC_S is which includes the external costs. The optimum production with this marginal cost curve is OQ* units.

So the conclusion is the production will be above the optimum social level in negative externalities.

Self Assessment

State whether the following statements are True/False:

9. Independent market or perfect competitive market does not give optimum social solution.
10. When CPR is maximum used then nutrition is its result.
11. Public goods or 'Communal consumption products' are the main factor of market failure.
12. Private cost is the cost which bears by a producer to produce a product.

7.7 Positive Externality

When the society gets uncompensated benefit by the production produces of a producer then it is called Positive Externality. This positive externality can occur by both direct and indirect form. For example, a person has apple orchid. There is a honey farm nearby. The bees collect honey from this apple orchid, and this honey production is profitable for the farmer who is owner of honey farm. But the owner of

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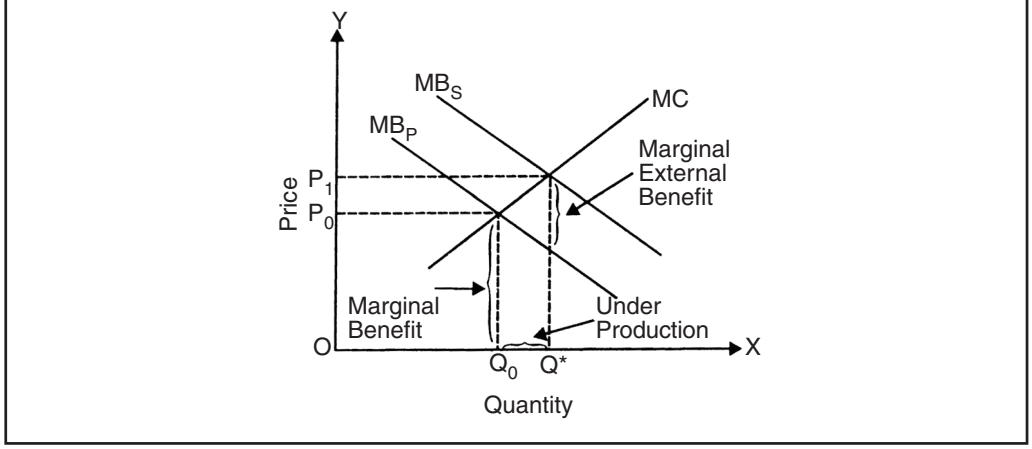
apple orchid does not include this profit in its marginal profit. In decision of his level of production, he only equalizes the marginal cost to his marginal benefit and does not bother about the external marginal profit of the bee farmer. Then on the basis of positive externality, which is socially expected, the minimum level of production will identify. This is represented by Fig. 7.5.

Fig. 7.5



In Fig. 7.5, the productive quantity of apple displayed on axis OX, while axis OY indicates the price. The production of OQ_0 units of apple occur on OP_0 price, so the marginal private profit is equal to marginal cost. When outer profit is included then MB_P becomes MB_S and thus, after internalization of externality the production of apples should be increased from OQ_0 to OQ*. Thus the result is that **total output is less than the socially optimal output in case of positive externality.**

Task Give your opinion on Excludable Goods and Market Failure.

7.8 Externalities and the Coase Theory

Due to externalities, the above described problems can solve by one more method and that is the person who was responsible for this externalities should give property rights. This thinking is the base of **Coase Theory**. To develop the Coase Theory, credit goes to famous British economist **Ronal Coase** who gets the Nobel Prize of economics in 1991. According to Coase Theory, "If two factors of an externality–one who is responsible for it and the other who is affected from it can agree on an agreement that they will produce the perfect production by factors." When a product's property right is described with clarity then an agreement can sign between beneficiary and victim and then the optimum social production of that product can occur.

For example, two students A and B live in a room. A smokes, but B doesn't. Student A always smokes while reading which results bad effect on B's health. Since the air in room is collective property of both the students, so the student B cannot force student A to stop the smoking. But if the property right of air of that room can be given to one of them then, an optimum satisfaction level can be obtained from both of the students A and B. First, if property right can give to student A, then he can say to student B that to low the smoke of cigarette in air he will pay

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suppose ₹ 1 per cigarette. Now the student B can use this money to get fresh air for himself. In contrast, if student B gets property right then he can say to student A that if he wants to smoke, he needs to pay some bucks (like ₹ 1 per cigarette). Student A can take decision of number of cigarettes and how many bucks he needs to pay to student B. Student B can take decision on money as well as the level of pollution.

7.9 High Transaction Costs

Costs theory is based on the assumption that there is no agreement or transaction happens on bargain process. For example, the above cigarette smoking students, we have assumed that they can make agreement by sitting in that room. Suppose that if two agents live in two different zones then to contact each other, everyone will need to pay on telephone, fax etc. In this condition, every agent will assume his pure profit gain after transaction. He would agree for deal when he gets his profit in positive after deducting the transaction cost from his agreement. In other words, if the agreement cost is more then it may be possible then two or all parties do not ready for bargaining, no matter how well-defined the property right is.

Generally, it has been observed that in externalities, there is more bargaining costs included in profit or loss. So the private agent does not come for deal. In this situation, government includes for the perfect solution.

One more negative externality is pollution, and to prevent this, government inclusion is necessary. The three types of factor which government can use to prevent this are Direct Pollution Control, Emission Taxes and to Give Permit. Since every factor has some limitation, so it needs to use effectively in certain conditions.

7.10 Summary

- Park, National Security, Roads, Bridges, etc. are non-rivalrous products. A park, in which everyone comes and goes and takes advantage to get relax. Thus, the persons of a nation can use the security provided by national security system.

7.11 Keywords

- **Property Rights:** Right of Property
- **Asymmetric Information:** Disequilibrium Information
- **Rivalrous:** Opponent
- **Excludable:** Prohibition

7.12 Review Questions

1. What do you mean by Excludable products and market failure?
2. Explain "Communal Property Resource".
3. What do you mean by externalities and market failure?
4. What is Negative externality? Clarify it.

Notes

Answers: Self Assessment

1. Monopoly	2. Below	3. Government	4. (a)
5. (b)	6. (a)	7. (c)	8. (a)
9. True	10. False	11. True	12. True

7.13 Further Readings

Books

1. **Microeconomics: An Advanced Treaties—** *S.P.S Chauhan, PHI Learning.*
2. **Microeconomics: Behaviour, Institutions and Evaluation—** *Sampoole Bowels Oxford University Press, 2004.*
3. **Microeconomics: Principles Application and Tools—** *Sanjay Basotiya, DND Publications, 2010.*

Notes

Unit-8: Pigovian Welfare Economics and Externalities

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Objectives

After studying this unit, students will be able to:

- Understand the concept of welfare.
- Know the Pigovian welfare conditions.
- Discuss the Pigou's concept of ideal output.
- Explain the external economies of production.

Introduction

The first recognized work on the welfare economics is "*The Economics of Welfare*" by **Professor A.C. Pigou. Professor Pigou** is considered as the father of welfare economics because **Dr. Little** has indicated, welfare economics started with **Professor Pigou**. Prior to this, we had Joy Economics and before that Monetary economics. **Pigou's** welfare economics can be divided, for convenience, into three parts—(1) concept of welfare; (2) welfare conditions; and (3) analysis of divergence between private and social cost and returns. We will study these accordingly.

Notes

8.1 Concept of Welfare

According to **Pigou**, welfare exists in the mind and conscience of a person which is made out of his/her needs and utilities. Thus, the extent to which a person's needs are fulfilled is necessarily the base of his/her welfare. In a society, social welfare is considered to be the central point of the welfare of all the people. As general welfare is a detailed, critical and an unusual concept, therefore, **Pigou** has limited his study to economic welfare only. He says that economic welfare is not an indication for total welfare because several elements of total welfare such as the value of work, environment of a person, human relations, post, residence, government security, etc. do not exist today in economic welfare. Therefore, he considers economic welfare as that part of social (general) welfare which in a direct or indirect way it is addressed as the criterion of currency. Therefore, according to **Pigou** the concept of welfare is the satisfaction or use of products or services of a human being.

Self Assessment

Fill in the blanks:

1. The Economics of Welfare written by **Professor** ..... is the first recognized epic on welfare economics.
2. Welfare economics was started by **Pigou**. Prior to that ..... economics existed.
3. According to **Pigou,** ..... exists in the mind and conscience of a person.

8.2 Pigovian Welfare Conditions

Pigou considers welfare and national income as, necessarily, co-ordinate. On the basis of this, he fixes two conditions to maximize the welfare.

First, the first condition specifies that when there is an increase in national income. There is an increase in welfare. If tastes and income distribution are given, the increase in national income represents the increase in welfare. According to **Pigou,** in most of the situations there will be increase in national income if there is an increase in the disutility of the work.

Second, to maximize the welfare, distribution of national income is essential. If the national income remains stable then the transfer of income from rich to poor will further the welfare. According to **Pigou,** such transfers have less impact on rich than on poor, as a result of which the economic condition of the poor improves. This welfare condition is based on **Pigou's** dual concepts "equal capacity for satisfaction" and "Diminishing marginal utility of income". **Pigou** argues that different people obtain equal satisfaction from the same real income and those who are now rich are different from those, in nature, who are now poor as the rich have more probability of consumption than poor. On implementing the rules of utility, transferring the income from rich to poor, by controlling the less immediate necessities of rich to fulfill the more immediate necessities of poor, the social welfare is increased. Thus, only economic equality can maximize welfare.

Dual criterion—To understand the progress in social welfare, **Pigou** adopts a dual criterion.

First, increase in national income or increasing some commodities without increasing some other commodities or shifting some resources for such activities, where their social relevance is maximum, is considered as a development in welfare provided there is no scarcity among the poor.

Second, any step in economics which increases the share of the poor without reducing the national income is considered a development in social welfare.

Assumptions of Pigovian Conditions—**Pigovian** conditions of welfare and dual criterion are based on following beliefs. Some of which have been already indicated.

Notes

1. Each person tries to fulfill his desires to maximum by sending on several objects and services.
2. There is also a belief that contentment derived from intra-personal and inter-personal form is comparable.
3. It is assumed that rule of diminishing marginal utility of income is implemented. It means when income increases, then the marginal utility of income decreases. As a result of this, with the use of extra income, a poor person gains more than a rich person loss, if we assume the income to be equal and that income is transferred from rich to poor.
4. Another belief is that "equal ability to achieve contentment" which is of the opinion that different people achieve same satisfaction with same actual income.

Only if these beliefs are given, **Pigou's** conditions of maximum social welfare can be fulfilled on the basis of dual criterion.

Its criticisms – Although **Pigou's** "The Economics of Welfare" is the first detailed analysis of economic welfare still its social conditions have been criticized below:

1. **The concept of Maximization is not clear: Pigou** emphasizes on the maximization of welfare but he does not specify the concept of maximization. His "maximization" is actually optimum. But this is a fixed point which is not correct because optimum is not fixed. It increases with increase in national income and decreases with decrease in national income.
2. **Pigou measures the welfare with the numerical cardinal process:** According to **Pigou,** welfare is measured by utility or contentment. Social welfare is considered to be combination of personal utilities of exchangeable commodities and services. Economists do not agree with this concept because utilities cannot be measured quantitatively. This is the reason the modern economists measure the utilities through the process of sequential ordinal process.
3. **National income is not the correct criterion for social welfare: Pigou's** "social conditions" are linked to national income. But estimating the national income is not an easy task. Then just by increasing the national income does not increase the social welfare. It is possible that due to inflation, an increase in national income may be visible and because of this the condition of the poor may worsen. Because of these reasons, modern economists measure the welfare on the basis of "election" instead of national income. For example, if any person elects A group of any commodity instead of B group then undoubtedly he gets maximum utility and contentment from A group. Thus, there is an increase in welfare.
4. **According to Prof. Robins, the belief of "Equal Ability of Man" does not make the study of Pigou's concept of welfare complete:** According to him, this belief is based on the principle of morality and not on scientific demonstration; this is not the decision of value.
5. **Pigou does not clarify the morality aspect of welfare:** The welfare economics is strongly related to ethics. But **Pigou** does not clarify it. The welfare economics is necessarily an idealist study in which valuable decisions and interpersonal comparisons are made. As **Pigou** does not relate these concepts with his "welfare" concepts, his "welfare economics" cannot be considered as actual study for welfare.

Due to these drawbacks, modern economists have formulated the thoughts of "amendment principle" and "social welfare function" which is an effort to give a new face to social economics.

Notes In a society, social welfare is considered as a congregation of the welfare of all people.

Self Assessment

Notes

Multiple choice questions:

4. When there is an increase in national income, there is an increase in ..... .
   (a) welfare (b) respect (c) non-welfare (d) none of these
5. To maximize the welfare ..... is important for national income
   (a) time (b) distribution (c) respect (d) variation
6. ..... maximizes the welfare
   (a) income (b) expense (c) economic equality (d) none of these
7. To understand the development of social welfare, Pigou adopts ..... criterion.
   (a) dual (b) general (c) economic (d) social
8. Pigou necessarily considers economic welfare and national income as ..... .
   (a) heaven (b) unnecessary (c) necessary (d) none of these

8.3 Analysis of Divergence between Private and Social Costs and Returns, or of Externalities or External Effects

Amidst marginal personal and social expenses and benefits, deviation externalities or external effects or external economies and diseconomies are known. "External effects" are assumed when the productivity of a firm or utility of a person is dependent on such means that cannot be sold or bought; at least currently such means are not exchangeable. External effects (between person and firms) are also known as untraded interdependencies which can be mutual or uni-directional. External production leads to production and production leads to consumption. This consumption can move toward production as well. Externalities are positive and negative. Profitable externalities are known as positive externalities. Expensive externalities are known as negative externalities. In other words, if personal gains are more than social gains then these are positive externalities or external economies. Actually, externalities are incomplete market, where market does not pay for the service or disservice of any commodity. Due to these externalities, there is maldistribution of means because of which production or consumption is left short of required level. Thus, because of external effects, maximum social welfare is not possible. **Pigou** should be credited not only for analyzing the reasons for external effects but also for providing solutions to remove the deviations due to social and personal expenses and benefits, which are described below.

Causes of divergences between social and private costs and returns— According to **Pigou,** free from the restrictions of ignorance and rigidity, there is equality in personal and social expenses and results. But some commercial behaviour give rise to rigidities by which changes are produced in personal and social expenses which through changes, tastes, business highs and lows, war and new business become more detailed. After obtaining external economies and diseconomies, there is difference in private product and social product by which deviation is found in social and personal expenses and profits. Now we will analyze these external economies and diseconomies.

1. **External economies of production:** When any firm without using the benefit and cost of any service provides the benefit and cost of same service to some other firms, then this is the external economies of production. Because of the lack of average cost of one or more firms, the external economies of production are obtained by other firms for their activities. The external economies of production are obtained when it becomes possible for one firm to obtain for other firms' trained labour, raw material, etc. at low rate. Under all these conditions, social marginal profit is more than the personal marginal profit and personal expenses are more than social expenses. This is because the firms that do the transmission do not ask anything from other firms for the expenses and benefits.

Notes

2. **External diseconomies of production:** External diseconomies of production bring changes in personal and social expenses and benefits when the production of any service or commodity by a firm has a significant effect on other firms in business. The example provided by **Professor Pigou** regarding air-pollution clarifies these differences. Assume that a factory is situated at a rich populated area and produces smoke. The smoke emitted from the factory spoils the health, house, household items, and clothes. As a result of this, the residential expenses increase several manifolds like washing the clothes, cleaning the household goods and cleaning the house and health expenses. These are social costs for which the factory never compensates the residents and thus gains. Thus, personal costs are less than social costs and the benefits of factory are more than social benefits because the owner of the factory escapes from the work done by the residents and therefore earns personal profit. Thus, in comparison to personal costs and benefits, social costs are more and benefits are less.
3. **External economies of consumption:** External economies of consumption are obtained from the delight of different consumers´ anti-market correlation. An increase in the consumption of commodity or service, which impacts the structure and desire of consumption of other consumers, is external economies of consumption. When a person buys a television set, then the contentment of his/her neighbours increases when they and their children watch various programmes. This is an example of external economies of consumption where social benefits are more than personal benefits and social cost is less than personal cost because the owner of the television set does not earn anything from the neighbours—nothing is gained in lieu of watching programmes.
4. **External diseconomies of consumption:** When a commodity or service used by a consumer has a significant effect on the structure and desire of the consumption of other consumers then it is external diseconomies of consumption. Diseconomies of consumption, in particular, are produced from clothing related to fashion and consumer goods. When a rich lady in a locality follows a new style of dressing then the old style of dressing is not only criticized by this lady but also by other ladies who try to imitate the style of dressing followed by the rich lady. This way the social costs are more than the personal costs and social benefits are less than the personal benefits. Those people who are not capable of adopting the consumption structure of their rich neighbours often experience the emotions of displeasure and envy as a result of which their productive ability is minimized and the social and personal costs and benefits see lot of differences. Another example is the noise nuisance created from loudspeakers.
5. **Public goods:** Differences in the social and personal benefits could be because of public goods which have been condemned by **Pigou. Professor Baumol** has defined public goods as something which when used by one person does not minimize the values of the commodity for another person. The consumption of public goods is equal. Some of the services provided by the government like national security, security of people, judiciary, disease control, etc. are public goods. Their benefits are undivided. This is available to each person irrespective of whether they give anything for this or not. That is why they do not come under exclusion principles. Another feature of public goods is that their benefits are available at zero margin cost. That is their benefits can be provided to anyone without any additional cost. For example, the cost to provide justice does not increase when another person demands justice from court. The third feature of public goods is that they bring changes in external and social and personal benefits. Externalities are produced when one person provides public goods then he provides benefits to other people and thus produces social benefits which is more than the personal benefits. For example, when a person, by taking initiative, sets up an electricity pole in the street near his house, then all other residents gain from it. As a result of this, the social benefit is more than the personal benefit.

Self Assessment

Notes

State whether the following statements are True/False:

9. According to **Pigou,** due to external effects there is no maximum social welfare.
10. Compared to personal costs and benefits, social costs are more and profits are less.
11. **Pigou** does not consider national benefit as an indicator of welfare.
12. Like **Pigou, Bomol** suggests that by the method of taxes and subsidy, external effects can be controlled.

Remedial measures—Pigou preferred state interference to bring equality in personal and social costs and benefits. **Pigou** suggests introducing taxes, economic assistance, and other social control measures to stop the differences in the cost and benefit that occur because of production and consumption externalities. We describe this below:

1. **Social control measures:** Primarily, **Pigou** suggests social control measures to obtain ideal output or optimum welfare. According to him, national benefit would be more if the value of social net product is equal to the every possible experiment. If the price of social net product of factor is less than a practice to the other then the national income benefits can be increased by transferring the factors. This is possible only by social control. For example, the government can provide adequate facilities to factory emitting smoke and then ask the factory owner to move the factory out of the residential area. By doing so, the differences in social and personal costs and benefits produced from the smoked nuisance are free from state interference. Regarding consumption diseconomies, the state, by restricting the use of loudspeakers for important events, can stop the noise. In monopoly situation, **Pigou** was in favour of any types of nationalization or social control.
2. **Taxes and subsidies:** Apart from this to end the differences between social and personal cost and benefits, **Pigou** suggests the use of taxes and subsidies. According to him, the state can impose taxes on external diseconomies of production and consumption. For example, the government can impose taxes on each family and then provide the collected amount to the factory owner to make him move out of the residential area. In the condition of external diseconomies of production, by providing financial assistance to the state consumers, the national benefits can be increased so as to achieve an ideal production. By providing tax relief to consumers, the government can increase the consumption ability of the consumers and thus helps in maximizing their desires.

   This is described by the curves of demand and supply. A demand and supply curve of a complete competitive market can only describe the visible personal benefits and cost but not the externalities. Externality exists if the full competitive market will not provide a socially optimal level. The government by imposing taxes and paying subsidies can internalize the externalities. Assume that social benefits are more than personal benefits which indicate negative externalities. In such cases, there is over-production of commodities that are required in society. To minimize this Pigou suggested imposing taxes on commodities. This is shown in Fig. 24.1 where D and S are, respectively, demand and supply curves. They intersect at E point and produces OQ. Curve S includes the cost of the commodities used by the consumers. This does not include negative externalities. When market supply curve S becomes identifiable and internalized the supply curve S_1 is created. Now, curve D intersects curve S_1 at point E_1 and OQ_1 production is fixed which is less than OQ. This is the social limit of production. On imposing taxes on consumers' commodities per unit T, the production of commodity will become less from OQ to OQ_1 which will decrease the negative outputs of OQ production. Thus, over production will be ended and social and personal benefits will be equal.

   When personal benefits are more than social benefits then these are positive externalities. In such cases, there is less production of commodities, as required by society. To increase this, **Pigou** has suggested providing per unit subsidy for the commodities of the consumers. This is shown in Fig. 24.2 where D and S are, respectively market demand and supply curve. This

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intersects at point E and produced OQ. But this is not the optimum social limit of production. To encourage the production of commodity from which positive externalities are obtained, the government provides the consumer subsidy equivalent to B by which the demand curve D moves upwards and becomes D_1. By this, the quantity of the produced commodity increases from OQ to OQ_1 which is the social optimum limit. Thus, to bring equality in social and personal costs and benefits, tax and subsidies are effective measures.

Fig. 8.1

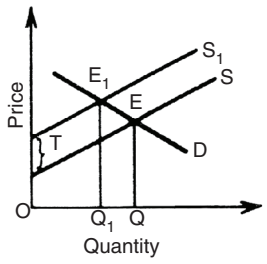
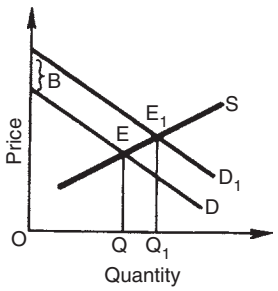


Fig. 8.2



3. **Public goods:** If the number of probable consumers of a public goods is more, then only with the assistance of public authority can the commodity be distributed among consumers. Because the benefits of common commodities are undivided, the government should adopt such measures that the cost of common commodities can be distributed among public so that each person can use it and thus lead a better life. Apart from this, if the probable benefit of public goods is greater than its cost, in which the government's imputed cost of expanding the workable is mixed then this, is within law of social welfare in the area of public activity.
4. **Unitization:** Another measure is amalgamation of externalities in production. When the firms are established in oil production in the same area, then drilling and pumping are done from it from which there are diseconomies of production. With the merger of firms and without the production diseconomies, oil can be produced very effectively.
5. **Property rights: Prof. Ronald Coase** has stated that the main source of externalities is the inappropriate assignment of the property rights. According to him if property rights are clearly defined then the affected person would adopt principle for amalgamation of externalities. Therefore, it is necessary that property rights are marketable so that personal dealings can be done. According to him the market may be goes into **Pareto** Optimum.

Did u know? Economic equality makes greater to the welfare.

8.4 Pigou's Concept of Ideal Output

Pigou's concept of ideal output is related to the highest level of welfare in economic methodology. By **Pigou** the national dividend is considered an indicator of welfare. According to **Pigou,** when the price of marginal social products is equal in all possible uses, then the national profit gets maximum. Where there

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is complete contest, the scenario of superior or ideal output is created. But, contrary to other experiments, in any one experiment if the value of marginal social output of institutions is less, then the unique product can obtain by changing more profitable factors through social restriction and taxes and subsidies.

Professor Baumol has given new description to **Pigou's** concept of ideal output and related it to **Pareto's** complete control. According to his definition, ideal output is that on which there can be no re-division of various experiments of economic institutions which can take society, compared to previous state it was in, to a better place. The definition of this ideal output is similar to that **Pareto** condition according to which welfare is maximum when through any economic regrouping the condition of one person, without changing the situation in the other, can be made better than it was earlier.

Baumol has described the problems of ideal output in the dictionary of modern analytical tools of economic welfare. His analysis is based on following assumptions—(1) there is competition in the demand for readymade goods in market. (2) There is proper distribution of all goods in the society. (3) Taste and technology never change in society. (4) Every person in a society gives preference to the maximum volume of the product and not the least volume. (5) The limit of placement of institutions is given. (6) There are no external effects of consumption and output. (7) The indifference curves do not intersect each other. (8) In economics, only two goods, X and Y, are produced.

Task Please state your thoughts on **Pigou's** concept of ideal output.

When these assumptions are provided, **Baumol** has proved in graphical form how a society reaches a situation of ideal output. Just concentrate on Fig. 8.3. In this figure, the production of object X is measured on horizontal axis whereas the production of object Y is measured on vertical axis. I, I_1 and I_2 are indifference curves which show the various coincidences of objects available to society. On any point the indifference curve shows the gradient of the objects between X and Y the rate of substitution (MRSxy). TC is a pictorial curve that, using available institutions and technology, shows various production co-incidences. A gradient of transfigurational curve on any point proportionally measures the social marginal cost (SMC) of X from the social marginal cost of Y. The gradient of transfiguration curve, in our example, is marginal rate of substitution between X and Y. This value line of MRT_{xy}, MSC_x/MSC_y is PL whose gradient makes P_x/P_y appear.

On point E, the society achieves a state of ideal output where transfiguration curve TC touches the highest possible group curve I_1. On this highest level, the society produces and consumes object OX_1 of X and OY_1 of Y. If there is any other speed other than point E on curve TC then would appear compared to group at much less indifference curve, like the I curve, and compared to welfare may appear at lower limit.

It can be proved that this ideal output is actually a competitive output. Because the belief is that there is total competitiveness and there is lack of external effects; therefore in the entire market the price of both commodities remains same. Thus from the demand side, control is exercised on point E where the value line PL touches the marginal curve I_1. Thus on point E.

$$MRS_{xy} = P_x/P_y \quad ...(i)$$

From the supply side, it is essential, for competitive control, that the gradient of value line is certainly equal to the gradient of transfiguration curve, that is

$$P_x/P_y = MRT_{xy} \quad ...(ii)$$

In the complete market, MRT_{xy} marginal personal cost of MC_y of Y is equal to the rate of marginal personal cost of MC_x of X. Because it is assumed that there is no effect in production and therefore marginal personal cost of production is equal to marginal social cost of production. Thus, the transfiguration curve says

$$MRT_{xy} = MC_x/MC_y = MSC_x/MSC_y$$

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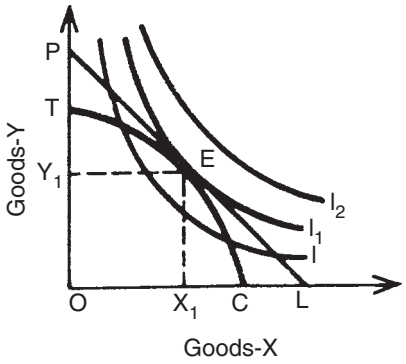
The output of (*i*) and (*ii*) states that competitive production is fixed at that place where value line and indifference curves are mutually tangent that is $MRT_{xy} = P_x/P_y = MRT_{xy}$ this is point E on Fig. 24.3. Actually, this competitive control is **Parotean** complete control or **Parotean** optimization. But ideal output is fixed at that place where transfiguration curve touches indifference curve. However, it is in the absence of external effects that the situation of competitive production and ideal output is same, which is shown as E in Fig. 8.3.

Fig. 8.3



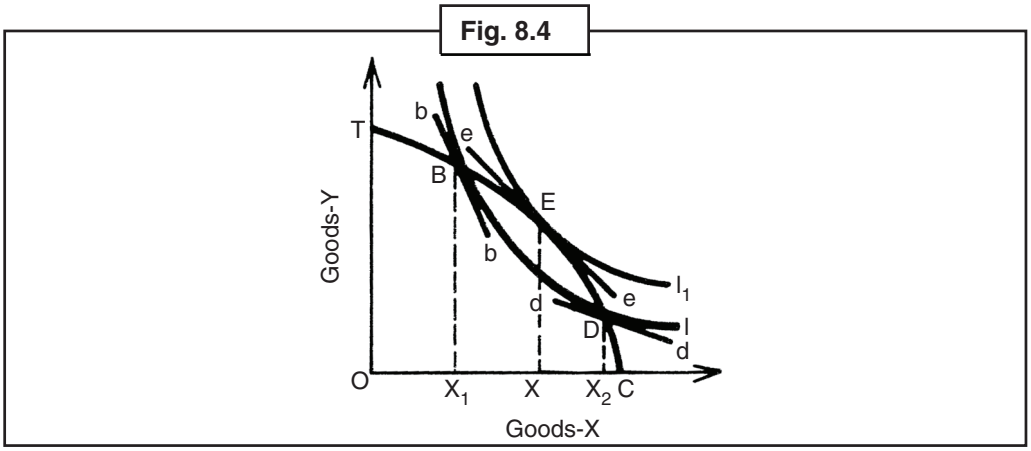
But if those who produce commodity X exist in business by external effects, then their marginal social cost will diverge from the marginal personal cost. Thus in this business, the average of marginal social cost and producers of commodity Y will not equal. In other words, transfiguration curve and value line are mutually not tangent.

First think of that situation where external effects are found in the production of commodity X. To control production, the required value line is shown as *bb* line in Fig. 8.4. The gradient of this line is more than the gradient of curve TC which means that the marginal personal cost is more than marginal social cost. Now think that external effects exist in the production of commodity X. Value is shown as *dd* line whose gradient is less than the gradient of transfiguration curve. Here compared to marginal personal cost, marginal social cost is more.

In the lack of external effects, point E is the point of ideal output where indifference curve I_1 and transfiguration curve TC touch each other. This is what the situation is for competitive production as well because value line touches to indifference curve I_1 and transfiguration curve TC. If during the situation of external diseconomies of production, commodity X is produced then control point is B which is to the right of E. Here value line is tangent to point B of indifference curve I where commodity X will be produced and therefore the control point is D which is to the left of E. Here value line dd touches indifference curve at point D where the output of commodity X OX_2 which is comparatively higher than its ideal output OX. Point B and D cannot be ideal output as they comparatively are placed below at indifference curve whereas point E is comparatively placed above curve I_1.

Notes

Fig. 8.4



Like **Pigou, Baumol** suggests that external efforts can be rectified through the methods of tax and subsidies and ideal output can be achieved. If the output of commodity X is more than the ideal output like on point D then by imposing heavy taxes on each unit of output, the output can be reduced. On the contrary, if the production of commodity X is less than ideal output as on point B, then by giving subsidy for each unit of output, we can increase the output. We can achieve ideal output only when the amount collected as tax can equal the subsidy paid by the government.

8.5 Summary

- To maximize the welfare, the distribution of national income is significant. If national income is fixed then transfer of income from rich to poor will further the welfare. According to **Pigou,** such transfers have less impact on rich compared to poor as a result of which the economic condition of poor improves. The condition of welfare is based on **Pigou's** dual concept "equal capacity for satisfaction" and "Diminishing marginal utility of income".

8.6 Keywords

- **Dual Criterion:** Two types of principles
- **External Effects:** Outer Effect
- **Over Production:** More Production
- **Unitization:** Process of being one

8.7 Review Questions

1. What are **Pigou's** welfare concepts? Explain.
2. Comment on external economies of production.
3. What are the measures of social restriction proposed by **Pigou** to obtain ideal output or highest welfare?
4. What do you understand by **Pigou's** concept of ideal output?

Notes

Answers: Self Assessment

1.	A. C. Pigou	2.	Pleasure	3.	Welfare	4.	(a)
5.	(c)	6.	(b)	7.	(a)	8.	(a)
9.	True	10.	True	11.	False	12.	True

8.8 Further Readings

Books

1. **Microeconomics: An Advanced Treatise—** *S.P.S. Chauhan, PHI Learning.*
2. **Microeconomics: Behaviour, Institutions and Evolution—** *Sampool Bowels, Oxford University Press, 2004.*
3. **Microeconomics: Principles, Applications and Tools—** *Sanjay Basotiya, DND Publications, 2010.*

Notes

Unit-9: The Social Welfare Function

CONTENTS

Objectives

Introduction

9.1 Bergson's Social Welfare

9.2 Summary

9.3 Keywords

9.4 Review Questions

9.5 Further Readings

Objectives

After studying this unit, students will be able to:

- Know about Social welfare function.
- Explain the criticism of the social welfare function.
- Discuss the equation of social welfare function.
- Study the majority rule.

Introduction

Prof. Bergson presented the theory of social welfare function for the first time and later **Samuelsson, Tintner** and **Arrow** have further developed this theory. Their opinion is that without adding value judgments, there cannot be any meaningful propositions in welfare economics. The concept of social welfare is an attempt to present the idealistic study of welfare economics from scientific view.

9.1 Bergson's Social Welfare

Social welfare function represents those factors on which welfare of society is assumed to be dependent. According to the definition given by **Bergson,** it is "either function of welfare of each individual of the community or is the function of goods consumed by each individual of the community and services rendered." In its original form, **Bergson** has presented social welfare function in an ordinary way. "This is that function which relates social welfare and all those possible variables which affect welfare of each individual like services and consumption of each individual. It can be assumed that "it is each individual's welfare function which successively depends as his personal evaluation of relation between that individual's own best state and distributed welfare among all members of the

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community." Thus, social welfare function is the function of ordinary numerical indication welfare of the society and individual ability. This is represented as:

$$W = F (U_1, U_2, ..., U_n).$$

Self Assessment

Fill in the blanks:

1. Theory of Social Welfare function is presented primarily by ..... .
2. Social welfare function theory is further developed by **Arrow , Tintner** and ..... .
3. The concept of social welfare is an attempt to present idealistic study of ..... .

Notes Social welfare function represents those factores on which welfare of a society is assumed to be dependent.

Where W is economic welfare of the society, F fuction is from U_1, U_1 , ..., U_n as 1, 2, ..., *n* level of using the individuals. W is increasing function of these utilities.

Weighing products on both axes drawing, well behaved social indifference curves series, social welfare fuction can be represented on figure. Every indifference curve represents different distributions of uilitites among those indivuduals, whose level of social welfare is equal. These curves help the policy makers in knowing that whether a particular economic policy will lead to progress or not. If any single change can take individuals to a more high indifference curve position, then it is assumed that there is an increase in social welfare.

Self Assessment

Multiple choice questions:

4. **Bergson's** social welfare fuction is based on some difinite ..... .
   (a) assumption (b) narration (c) rituals (d) none of these
5. The concept of social welfare is an attempt to present ..... study of welfare economics by scientific view.
   (a) idealistic (b) communist (c) economically (d) none of these
6. Every welfare curve presents the ..... social welfare.
   (a) base (b) economical status (c) level (d) none of these
7. According to Burgson's theory, the social welfare depends upon the money and ..... .
   (a) Capital (b) Level (c) Income (d) None of these

Social welfare function is explained in Fig. 25.1. FF_1 is utility frontier, which expresses the boundary of all possible utility combinations derived from given function of the economy. It enters when many utility possibility curves covered on another. In Fig 9.1, W, W_1 and W_2 expressing the social welfare function are family of curves. Each welfare curve expresses the focus of welfare combination of utilities of two persons A and B, for which both the individuals are indifferent. Every welfare curve shows the level of social welfare. Welfare curve W_1 shows higher level of social welfare than W and W_2 shows higher level of social welfare then W_1. Maximum social welfare or optimum situation is that where utility frontier FF_1 touches welfare

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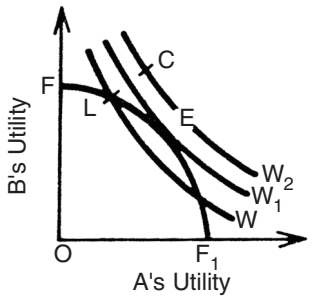
curve W_1. In the diagram, point E clearly shows the maximum social welfare state or Bliss point. Constraints of given technology and fixed quotation of inputs whatever with the given technology and constraints of fixed quantities of inputs with society whatever the welfare combinations are obtained E is the maximum society values. Point L lies the lower welfare curve W and expresses low level of social welfare where point C situated in W_2 is outside utility frontier of society FF_1. So the point E expresses the maximum social welfare.

Fig. 9.1



Did u know? Social welfare function is the function of ordinal numerical indication of social welfare and individual utility.

Its Assumption—Bergson's social welfare function is based on some assumptions—

1. This theory assumed that social welfare is dependent on income and capital of every individual and welfare of each individual depends on his personal property and income as well as the distribution of welfare of the members of the society.
2. It acknowledges the presence of outer economy and diseconomy and their effect in present.
3. It is based on ordinal numeric ranking of combinations of variables affecting the individual welfare.
4. In this function, the interpersonal comparisons of utility, in which price decision includes, are found.

Its Criticisms—With these assumptions, the social welfare function according to **Prof. Samuelson** "becomes as broad and empty as essential language." Other economists welcomed it as "major contribution in welfare economics", where the opinion of **Dr. Little** "completes formal mathematical settlement of welfare economics." **Sketovosky** believes it as "totally ordinary" and his aim is to identify the formal and rigorous restatement. For instance incorporating of social welfare function can remove the uncertainty found in Pareto Optimum. But this function has also some limitations.

Task Expresses your views on Bergson's social welfare.

Notes

1. **No relation to practical policy:** Dr. Little comprehends it as impractical in totalitarian state and it is also the more impractical in democratic state "where there are many faded social welfare functions as per their member. It can be accepted as essential formal factor for a general independent adjustment of the welfare which has no relation with the practical policy."
2. **Difficult to construct social welfare function:** One more difficulty arises in the construction and shape of welfare function. On adding the preference of each individual, social welfare function is constructed. But the problem is individual preference should be given equal weight of different. It makes a hard talk to create a social welfare function.
3. **Equations and curves arbitrary and imaginary:** Representation social welfare function in equations or social indifference curves does not help in solving the problem as individual welfare function cannot be estimated. Thus all the equations and curves representing social function are arbitrary and imaginary.
4. **Without empirical significance:** According to **Dr. Little** the concept of maximum is without any possible empirical significance, so it would be better not to use it at all. It is more meaningful to derive the optimum conditions in adequate state without trying to define a maximum situation.
5. **Not possible to construct social welfare faction based on individual preferences:** Prof. Arrow described that if individuals has to choose from two or more alternatives then constructing social welfare function, the basis of ordinal member presence had to mutually oppose results. Suppose there are three persons, A, B, C, who are to choose from these possible social situations X, Y, Z members 1,2, 3. The obtained statistics are shown in Table 9.1. A will give preference to X as compared to Y, and to Y than Z, so he gives more preference to Z in comparison to X. B prefers Y than Z, Z than X and so Y is preferred more than X. C prefers Z than X, Y so prefers Z in comparison to Y. If individual preferences are given equal significance, then on the basis of majority rule, social function can be constructed. But majority rule leads to mutually opposing results. Two person (A and C) give preference to X more than Y and two persons (B and C) give more presence to Z than X. It clarifies the paradox of majority rule, which according to **Prof. Arrow** is deadlock and so creates undesired inaction in respect to socialization. Thus, the creation of a social welfare function is not possible, which considers preferences of every individual.
6. **Not helpful in solving the main problems of welfare economics:** According to **Prof. Baumol**, "social welfare function does not come and equipped with that kind of instructions, which is required for it." Thus, the welfare is not very helpful to solve the main problems of economics.

Self Assessment

State whether the following statements are True/False:

8. As per Dr. Little opinion, "The welfare completes the formal mathematical task of economics."
9. One more difficulty arises in the construction and shape of creation of welfare function.
10. Incorporating social welfare function can remove the uncertainty found in Pareto Optimum.

9.2 Summary

- Social welfare fuction represents those factiors on which welfare of a society is assumed to be dependent. Accoding to the definitions given by **Bergson**, it is "either the fucntion of welfare of each individual of the community, or the fuction of goods consumed and the services rendered by each individual of the community."

9.3 Keywords

Notes

- **Bliss Point:** Point of much pleasure
- **Technology:** Technical

9.4 Review Questions

1. What do you understand by Bergson's social welfare?
2. The social welfare function is not possible by individual presence. Why?

Answers: Self Assessment

1. Professor Bergson	2. Samuelsson	3. From Scientific View	4. (a)
5. (a)	6. (c)	7. (c)	8. True
9. True	10. False		

9.5 Further Readings

Books

1. **Microeconomics —** *Frank Cowbell, Oxford University Press, 2004.*
2. **Microeconomics —** *Robert S. Pindick, Daniel L. Rubinfield and Prem L. Mehta, Pearson Education, 2009, PBK, 7th Edition.*
3. **Microeconomics —** *David Bosanko and Ronald Brutigame, Wiley India, 2011, PBK, 4th Edition.*

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Unit-10: General Equilibrium Theory

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Objectives

Introduction

10.1 Problems of Existence, Stability and Uniqueness of General Equilibrium

10.2 The Walrasian General Equilibrium Model

10.3 2 × 2 × 2 Graphical General Equilibrium Model

10.4 Summary

10.5 Keywords

10.6 Review Questions

10.7 Further Readings

Objectives

After studying this unit, student will be able to:

- Know Problems of Existence, Stability and Uniqueness of General Equilibrium.
- Study The Walrasian General Equilibrium Model.
- Understand Graphical General Equilibrium Model.

Introduction

In this unit, you can learn The **Walrasian** General Equilibrium Theory, Graphical 2 × 2 × 2 General Equilibrium Model and the significance of general equilibrium, stability and uniqueness problems. Marginal equilibrium, general equilibrium and other equilibrium theories have included in the first unit of the book "Concept of Equilibrium".

10.1 Problems of Existence, Stability and Uniqueness of General Equilibrium

Problems of Existence, Stability and Uniqueness of General Equilibrium are included in general equilibrium analysis. It is described by the demand and supply curves of marginal equilibrium and the results are used in general equilibrium analysis.

Notes

1. Existence of General Equilibrium

The existence of General Equilibrium relates to the behaviour of sellers and buyers and how it affects the demand and supply curves. When demand and supply curves is equal on a positive price, this is equilibrium. This price is called Equilibrium Price. The demand and supply on this price is called Equilibrium Quantity. There is neither excess demand nor excess supply on equilibrium price. Symbolically,

$$E_D = Q_D - Q_S = 0$$

Where E_D is excess price; Q_D is quantity of demand and Q_S is quantity of supply. The excess price is that point where the demand curve intersects supply curve in a specific price. These curves should intersect each other in a positive price for existing of general equilibrium. The condition of general equilibrium is—

1. In this price, consumer gets full satisfaction as well as producer gets profit maximization.
2. All markets get empty on this price means the products are equally supplied and demanded in a market in a positive price.

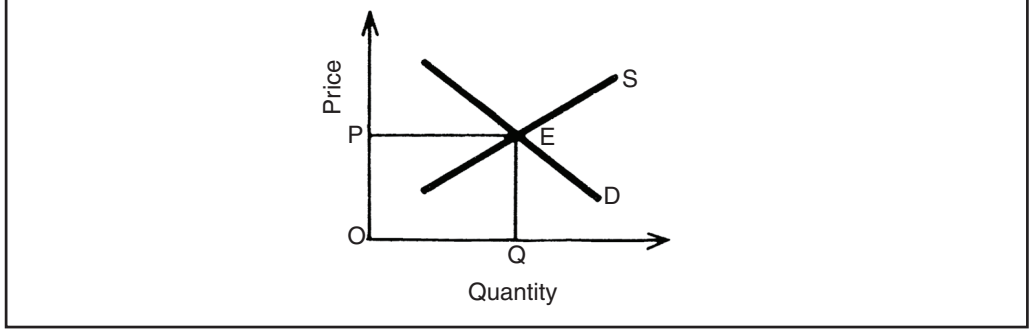
Self Assessment

Fill in the blanks:

1. Problems of Existence, Stability and Uniqueness of General Equilibrium are included in ..... . analysis.
2. The existence of General Equilibrium relates to the behaviour of sellers and ..... .
3. The quantity of demand and supply in a price is called ..... .

The Fig. 10.1 represents the general equilibrium, when the demand curve D intersects supply curve S on point E and OP is fixed price which is positive. This price equalizes the OQ quantity of demand and supply in market. This figure can be applied on market factor and product factor where the equilibrium comes at a time.

Fig. 10.1



According to **Airo and Debro**, when in a perfect competitive market, the difference factor does not found then there general equilibrium exists.

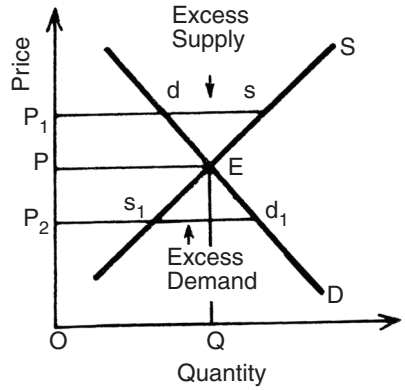
Notes

Notes The existence of General Equilibrium relates to the behaviour of sellers and buyers.

2. Stability of General Equilibrium

The general equilibrium exists when the equalization of demand and supply dismissed and the excess demand or supply takes the demand and supply to its equilibrium state. Diagrammatically, when demand curve intersects supply curve from upward, then the general equilibrium happens. The equilibrium state is shown on Fig. 26.2 where D demand curve intersects S supply curve on point E which is equilibrium point. In OP equilibrium price, OQ product quantity is sold and bought. If the price falls from OP to OP_2 then demand $P_2d_1 > P_2s_1$ supply and s_1d_1 is excess demand. Since demand is greater than supply so the price OP_2 would come on equilibrium price OP. If price goes from OP to OP_1 the supply $P_1s > P_1d$ where *ds* is excess supply. Since demand is lower than supply so every seller will sell their product by decreasing its price. Thus, the competition in seller the OP_2 price will come in equilibrium price OP. Thus, in OP price point E represents the equilibrium state.

Fig. 10.2



On the other hand, non-equilibrium is the state where the equilibrium does not exist if once changes. In geogramatical view, when demand curve intersects the supply curve downward then there is non-equilibrium stage. This is represented in Fig. 10.3 where D demand curve is upward slopping and cuts S supply curve in point E downward and OP is equilibrium price. If the price increases from OP to OP_1 then demand is $P_1d > P_1s$. The price goes up when demand is greater than supply and the excess demand will not end even the price rises. This increases the problem because the equilibrium stage E never gain again. Similarly, the instability is found downstream. When price falls from OP to OP_2 then d_1s_1 is excess supply which again falls the price and thus, the equilibrium stage E never happens.

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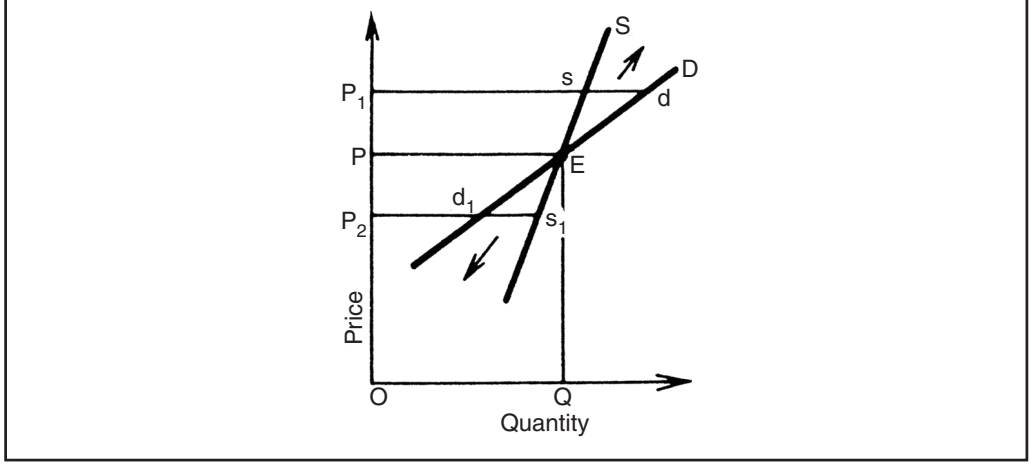
Fig. 10.3



Self Assessment

Multiple choice questions:

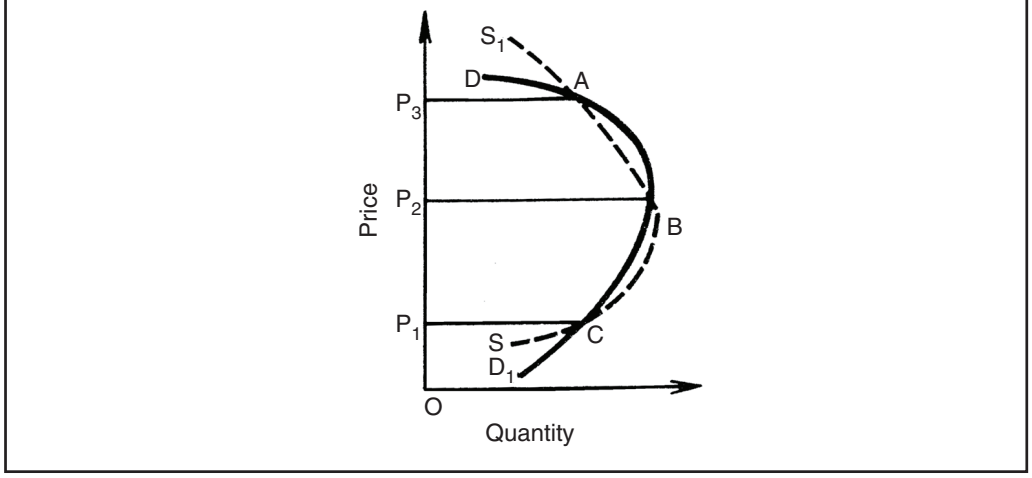
4. When in a perfect competitive market, the difference factor does not found then there ..... exists.
   (a) general equilibrium (b) market equilibrium
   (c) financial equilibrium (d) none of these
5. One equilibrium comes when demand and supply curve equals ..... .
   (a) in a negative price (b) in a positive price
   (c) in a general price (d) none of these
6. Walrasian General Equilibrium needs market equilibrium ..... .
   (a) never (b) always
   (c) no (d) none of these

Multiple Equilibrium is also represents non-equilibrium as well as equilibrium stage. **Marshall** has proposed many equilibrium and non-equilibrium stages by the help of multiple equilibriums which is shown in Fig. 10.4. He describes, "The equilibrium of demand and supply depends upon the intersections of demand and supply curves."

The multiple equilibrium is shown in Fig. 26.4 where the demand curve DD_1 and supply curve SS_1 has 3 equilibrium curves A, B and C. Point A and C are fixed equilibrium. Point A is of fixed equilibrium because when the price goes up by OP_3 then the supply is greater than demand. The competition to excess selling in sellers drops the price and equilibrium comes again on OP_3. If the price is lower than OP_3 then the demand is greater than supply. The competition between sellers for lower supply, price again comes on OP_3. Thus point C is fixed. When price goes up from OP_1 then the supply is greater than demand, the competition between sellers will lower the price on OP_1.

Notes

Fig. 10.4



If price falls from OP_1 then the competition between sellers will higher the price and price will come on OP_1. The point B is unstable equilibrium point. If price goes up from OP_2 then there is excess demand and due to the competition of sellers the price will go up from equilibrium point. In other hand if price falls from OP_2 then there is excess supply. The sellers will lower their price due to the competition to sell more till the point C does not get new equilibrium level.

Above analysis is based on **Marshall's** Equilibrium conditions. But in the view of **Walrasian,** the condition gets opposite in fixed and variable equilibrium. The equilibrium will be fixed where the demand curve cuts supply from upwards while equilibrium will variable where it cuts downward. So for Walras, the condition of A is fixed equilibrium, B is equilibrium and C is for variable equilibrium. This happens because the condition of fixed equallibrium of **Marshall** is based on price determination concept while Walras's Quantity determination concept.

Thus, in The **Walrasian** General Equilibrium the market is always in the fixed equilibrium. This comes by repetitive process. If there is variable equilibrium then every market will search for their equilibrium price. When this quantity price is repeat then the economical condition gets general equilibrium by groping as well as trial and error process. **Aero** and **Hurwitz** have shown that the **Walrasian** system is fixed while some economists have proved this variable. According to **Aero** and **Debro**, the **Walrasian** system is fixed when the factors of scale are decreasing or fixed, no changes in consumption and production and every product is gross substitute means by increasing one product's price, others get positive excess demand.

3. Uniqueness of General Equilibrium

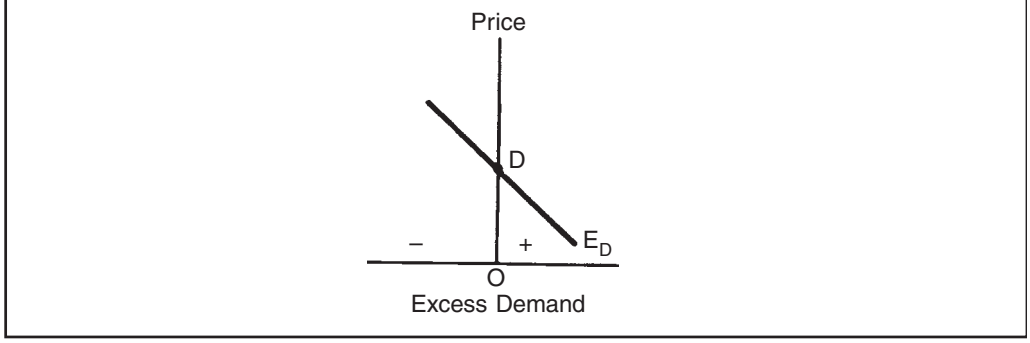
When one set of quantity and price fulfils the conditions of equilibrium, then this is unique equilibrium. For example, the equilibrium is fixed and unique in Fig. 10.1 because only one price OP and quantity OQ comes stability in market which is unique.

The uniqueness of equilibrium can also be defined by the concept of excess demand. The excess demand (E_D) is the difference between demand (Q_D) and supply (Q_S).

$$E_D = Q_D - Q_S$$

Notes

Fig. 10.5



In geometrical form, the excess demand is shown by excess curve which is drawn by a price of the difference between demand and supply curve. For Figs. 10.2, 10.3 and 10.4, the excess demand curves are drawn until Fig. 10.5 to 10.7.

Let's take Fig. 10.2. When D curve intersects curve S on OP price then both the curves are in equilibrium on point E. The excess demand is zero here means $E_D = 0$. On that reason where D is greater than S (P_2d_1, P_2s_1) excess demand is **positive** and where S is greater than D (P_1s, P_1d), the excess demand is **negative**. The slope of excess demand curve is negative (downward from left to right) for general D and S curve means $E_D < 0$. When the slope of excess demand curve is negative on point after intersects the axis of price as shown in point D in Fig. 10.5, the equilibrium is fixed and unique.

Fig. 10.6

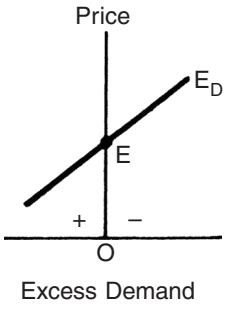
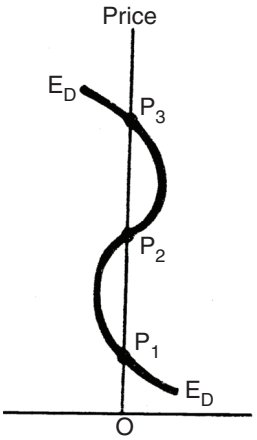


Fig. 10.7



Now take Fig. 10.3 where demand curve intersects supply curve downward. The excess demand is positive below equilibrium price OP and above this, it is negative. So, the slope of excess demand will positive, means $E_0 > 0$. When the slope of excess demand curve is positive by intersect of price axis, as shown in Fig. 10.6 on point E, then the equilibrium is variable and unique.

Notes

Figure 10.7 represents multiple equilibriums when it is drawn in basis of excess demand of Fig. 10.4. The curve E_D cuts the concave price axis on P_1, P_2 and P_3 points which describe the multiple equilibriums. The slope of E_D curve is positive on point P_1 and P_3 while both equilibrium conditions are unique and fixed. But the slope of E_D curve is positive in point P_2 which represents variable but unique equilibrium. To take the above analysis and uniqueness of equilibrium can rise until general equilibrium with relation of production and market and its dependencies.

Did u know? The quantity of demand and supply on price is called equilibrium quantity.

10.2 The Walrasian General Equilibrium Model

The French economist **Leon Walras** was the first who proposed a model of general equilibrium in his book **Elements of Pure Economics** in 1874. **Walras** has proposed that in every market, all the prices and quantities determines by affecting each other. **Walras** was used a system of equations for describing the functions of buyers in markets and told that the price of every related products and factors can be determine with this model.

Its Assumptions

The Walrasian General Equilibrium Model is based on these following assumptions—

1. The product and factor are in perfect competition in market.
2. The interest of consumer is given and fixed.
3. There is no joint product.
4. There is no development.
5. There is no investment or disinvestment.
6. Factor of scale is fixed.
7. All units of a factor's service are equal.
8. The factors of production are in motion.
9. There is full employment.
10. There are no externalities in consumption or production.
11. Every product is substitute of each other.

The Walrasian System or Model

If above assumptions are given, **Walras** has proposed a system by differentiating the correlate product market and factor service market. In product market, consumer buys products which are supplied by firms and they sell their services to the firms. Thus, the firms sell their product to consumer and buy factor services from consumers. Thus, there is a set of correlate dependencies of firms and consumers. The unknown variable in this system is the price and products of all services and products.

To describe the Walrasian Model, we are using the same sign—

Notes

$a, b, c \ldots n$ represents the product.

$p_a, p_b, p_c \ldots n$ represents the relative price of product.

$t, p, q \ldots m$ represents the factors of production m for production of readymade product.

$p_t, p_p, p_q \ldots m$ represents the price of factors of production.

To get rid from the complexity of capital, **Walras** used a product *a,* which he called numeraire and the price of all products are represented by this unit. The price of numeraire is $p_a = 1$.

The initial quantity ($q_t, q_p, q_q \ldots$) of factor service on given price ($P_t, P_p, P_q \ldots$), every consumer gets maximum satisfaction when the quantity of factor services ($O_t, O_p, O_q \ldots$) **multiplied** its price ($p_t, p_p, p_q \ldots$) equal to demanded quantity of product ($d_a, d_b, d_c \ldots$) multiplied its price ($p_a, p_b, p_c \ldots$). Thus the equation comes as—

$$O_t p_t + O_p p_p + O_q p_q + \ldots = d_a p_a + d_b p_b + d_c p_c + \ldots$$

This is budget equation.

Now we need m **individual demand equation for consumer** products which depend upon the price of one product and all other products which he can buy and on that price which he sells to firms for his services. This relation is represented by the following set of equation—

$$d_a = f_a (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$
$$d_b = f_b (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$

Now we create n **individual supply equation** for factor services.

$$O_t = f_t (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$
$$O_p = f_q (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$

By addition the above equations, we get—

(1) The market demand equation for m product is—

$$D_a = \Sigma d_a = F_a (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$
$$D_b = \Sigma d_b = F_b (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$

(2) The market demand equation for n factor service is—

$$O_t = \Sigma O_t = F_t (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$
$$O_p = \Sigma O_p = F_p (p_t, p_p, p_q, \ldots p_a, p_b, p_c \ldots)$$

When market demand equation for product is equal to market supply equation of services then Walrasian Market Equilibrium happens. Thus, from (1) and (2) we get—

$$D_a = O_t$$

And

$$D_b = O_p$$

Then in Walrasian system, the factor services should be equal to its supply quantity and the price of product should be equal to its average cost of production. These two conditions again give two sets—

1. The quantity of factor services should be equal to its quantity of supply for clearing the market for n factor service—

$$O_t = a_t D_a + b_t D_b + c_t + D_c + \ldots$$
$$O_p = a_p D_a + b_p D_b + c_p + D_c + \ldots$$

Notes

2. The average cost of production is equal to the price of m product—

$$a_t p_t + a_p p_p + a_q p_q + \ldots = 1$$
$$b_t p_t + b_p p_p + b_q p_q + \ldots = p_b$$

Thus the equation is $2m + 2n$. No equation is independent because the budget equation needs to be equal for every human to satisfy this equation. We have left with $2m + 2n - 1$ independent equation and this is equal to the number of unknown of determined-(1) n quantity of supplied factor services; (2) m quantity of demanded products; (3) n price of services and (4) $m - 1$ price of product because $p_a = 1$ is described.

Since the number of independent equations is equal to number of unknowns, so the Walrasian General Equilibrium model is fixed. But the equalization of number of independent equations and number of unknowns is not an essential condition for solution of model. This is not uniqueness and not an essential condition. This is because the Walrasian system is does not include the negative price of factor services and products and negative quantity of products and factors. In this model, we cannot determine absolute prices. So, the Walrasian Model is not determined because no equation is independent from equations which assume that there is low equations than low unknown as $p_a = 1$.

Walras has solved the problems of determination of general and fixed equation by using tatonnement and groping. Suppose that all sellers and buyers disclose the quantity which they want to sell or buy on prices. The business is an auction in perfect competitive markets. The auction man auctions the product and businessman tells the price. But the price and agreement are not happens until a set of equilibrium prices does not reach. If the demand is high for a set of any products then auction man increases the price of that particular product and lower the price if supplies more. They make this type of announcement until they do not reach in a price which makes equilibrium in general market. To sell and buy the production services, Walras has proposed that producer gives "tickets" by which they can buy a given quantity of services. These "tickets" tie temporarily to the producers and sellers. Only the price of all systems will come in equilibrium when the agreed price should be matched with equal demand and supply of services. Thus the Walrasian Model represents the determination of general market equilibrium and how it fixes.

Its Criticism—There are some limitations in Walrasian General Equilibrium along with determination problem.

First, it is based on many real conditions which are unreal in world. The perfect competition, which is based on this concept, never happens.

Second, this model is fixed. In this model, every producer and consumer, without wasting any time, consumes and produces fixed products. Their interests, preferences and economical decision are similar to each other. In fact, it never happens. The producer and consumer never think in a similar way and never work accordingly. The preferences and interests are always changed. The factors of scale never fixed and no two factors are equal. Thus the production cost of every producer is different. Since the condition, given by **Walras** has always changed, so the movement towards general equilibrium stops and nobody can achieve it.

Last, we cannot remove many concepts because the model of **Walras** is set of simultaneous equations which end in lack of those concepts. Thus this model starts with the base of equations which make it difficult. So the usefulness of this concept ends for normal student of economics.

Self Assessment

State whether the following statements are True/False:

7. Diagrammatically, excess demand is shown by excess curve.
8. The French economist **Leon Walras** was the first who proposed a model of general equilibrium in his book *Elements of Pure Economics* in 1874.

9. There is no perfect competition in product and service market.
10. There is no externality of production or consumption.

Notes

10.3 2 × 2 × 2 Graphical General Equilibrium Model

Below we have studied a graphical condition of a static perfect competitive economy in which there are two consumers, two products and two factors. This is called 2 × 2 × 2 equilibrium model.

Its Assumptions

This model is based on following assumptions—

1. There is perfect competition in product and service market.
2. Labour and capital are two similar and completely divided factors of production. Both are available in fixed quantity.
3. Both the factors are in full employment.
4. Only two similar products X and Y are produced in economy. These products are available in limited quantity. The production equation of every product has given and does not change. Every production shows fixed factors of scale. There is MRTS with any Isoquant curve. It means that Isoquant curve is convex to its origin.
5. There is no externality of production.
6. There are two consumers A and B in economy which consume all quantities of X and Y. Every consumer has a set of convex indifference curves towards origin.
7. There is no externality of consumption.
8. Every consumer wants to maximize his satisfaction on a given income.
9. The consumer is owner of both the form of production.
10. Every firm (producer) wants to profit maximization on a given production equation.

On these given assumption, the economic is in general equilibrium state when two product markets and two factor markets, and two consumers and two firms individually are in equilibrium in a set. There are three characteristics of this general equilibrium model—*(i)* General Equilibrium of Exchange or Consumption *(ii)* General Equilibrium of production and *(iii)* General Equilibrium of Exchange and Production.

Task Give your views on Walrasian General Equilibrium Model.

(*i*) General Equilibrium of Exchange or Consumption

To general equilibrium of exchange, it is necessary that the marginal substitutional rate of two products should be equal and consumes both the products. It means MRS should be equal to its average price between two consumer products. Since in perfect competition, every consumer wants to maximize his satisfaction, so he will equal to his MRS to its average price (P_x/P_y) for product X and Y. In this model, if there two consumers A and B, two products X and Y and on given price average P_x/P_y, the general equilibrium comes when consumer A selects X and Y like ${}_AMRS_{XY} = P_x/P_y$ and consumer B selects X and Y like ${}_BMRS_{XY} = P_x/P_y$. So, the condition of general equilibrium for both the consumers:

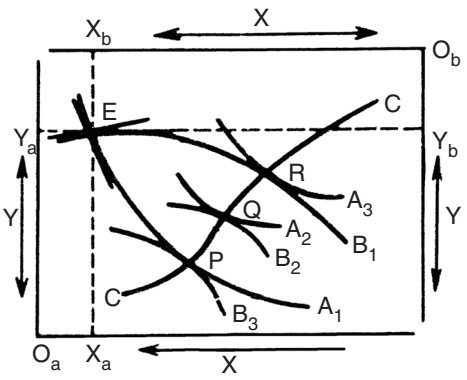
$${}_AMRS_{XY} = {}_BMRS_{XY} = P_x/P_y.$$

Notes

The Fig. 10.8 represents the general equilibrium of exchange. Let's take two consumers A and B, they have quantity of product X and Y respectively. O_a is original point of consumer A and O_B is original point of consumer B (revert the diagram to understand). The horizontal lines of both the product O_a and O_b represent product Y and vertical line represents product X. A_1, A_2 and A_3 curves represent the indifference drawing of product A while B_1, B_2 and B_3 for B. Any points in this box represent the expected distribution of production between both the consumers. See point E where A_1 and B_1 indifference curves intersect each other. In this stage, A has O_aY_a units of product Y and O_aX_a units of products X. B has O_bY_b of Y and O_bX_b units of X. The MRS on point E is not equal to its price because the slope of curve is not equal. Thus the equilibrium exchange point E is not for product X and Y to A and B. But both have the base of exchange.

Suppose that A needs more of product X and B needs more of product Y and they come from E to R. A gets more quantity of X in point R, while B gets more quantity of Y on it. The condition of B does not change because he still on that indifference curve B_1, but A is in better condition on R because he steps ahead from A_1 to A_3 indifference curve. But if A and B both come from E to P then the condition of A remains same because he is still on that indifference curve A_1. Since B goes onto B_3 so his condition gets better. They both in good indifference curves A_2 and B_2 respectively when they step from E to Q.

Fig. 10.8



Thus, P, Q and R are three thinkable points in exchange. When these points are added by CC line, then contract curve has made. The general equilibrium of exchange will always on contract curve where ${}_AMRS_{XY} = {}_BMRE_{XY}$. This general equilibrium of exchange is not unique because it can happen in any point of contract curve.

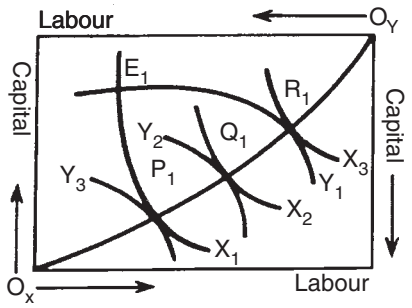
(*ii*) General Equilibrium of Production

The general equilibrium of production comes when the MRTS between labour and capital of product X ($MRTS_{LK}$) is equal to MRTS of the same of product Y ($MRTS_{LX}$). ${}_XMRTS_{LK} = {}_YMRTS_{LK}$.

The Fig. 26.9 describes the general equilibrium of production. To produce two products X and Y, economy has limited two factors labour (L) and capital (K). O_Y is the original point of labour factor. Labour has indicated vertically while capital is on horizontal line with original point O_Y. The vertical line O_X and O_Y represent product X and horizontal line represents to Y.

Notes

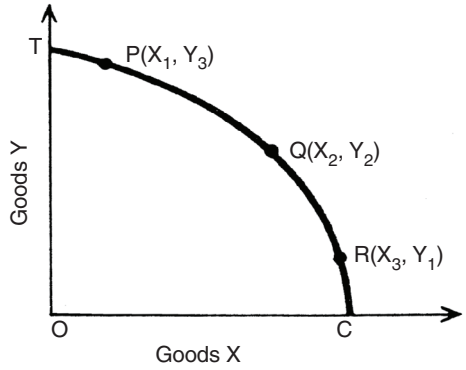
Fig. 10.9



The production equation of every production comes from similar curves. The characteristics of it is fixed factors of scale and decrease MRTS. For product X, which original point is OX, has similar curves X_1, X_2 and X_3 while for product Y, which original point is OY, has similar curves Y_1, Y_2 and Y_3. If initially the economical system is on point E then it does not maximize the production of X and Y because on point E_1, the slope of X_1 is greater than $Y_1 - {}_XMRTS_{LK} > {}_YMRTS_{LK}$. To substitute labour for capital, firms will move from point E_1 to either R_1 or P_1. The production of one product will increase while another will be fixed. Thus to substitute labour and capital, firm can go to point Q_1 and increase the production of product X and Y. The similar curve of product X is cogent to product Y on P_1, Q_1 and R_1 and so it fulfills the condition ${}_XMRTS_{LK} = {}_YMRTS_{LK}$. To conjugate these points, the contract curve $O_XP_1Q_1R_1O_Y$ is created. This shows all combinations of capital and labour which equalize ${}_XMRTS_{LK} = {}_YMRTS_{LK}$ on contract curve. But this general equilibrium of production is also not unique because it can happen on any point of contract curve.

The production related to contract curve $O_XP_1Q_1R_1O_Y$ from Fig. 26.9 is indicated as TC in Fig 10.10. This indicates the combinations of X and Y which can create by using fixed quantity of labour and capital. Concentrate on point P in Fig. 10.9. Y_3 indicates 600 similar units of product Y and X_1 indicates 100 units of product X. This has drawn as point P in Fig. 10.10. By adding points P, Q and R we creates expected production curve TC for product X and Y. If the labour and capital is fixed as well as technology, then economy cannot reach above TC curve. Also there is no economical point inside TC curve. So to maximize the production of X and Y, it is necessary to stable the economy on TC curve. In Fig. 10.10 the slope of any point on expected production curve indicates the MRT of X from Y. In other words, to produce an extra unit of product X by substituting capital and labour, how much production of product Y should less.

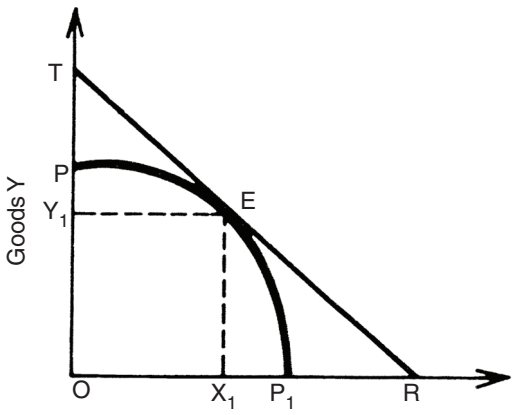
Fig. 10.10



Notes

In perfect competition, the firm having profit maximization will be on production equilibrium when isorevenue line touches transformation curve. It means to get equilibrium of firm, MRS should be equal to its average price between both X and Y product—MRT_{XY} = PX/PY. This law is demonstrated in Fig. 10.11. MRT_{XY} is measured on any point of transformation curve PP_1. TR is isorevenue line whose slope indicates P_x/P_y. The slope of transformation curve PP_1 is equal to the slope of isorevenue line TR on point E. Thus, $MRT_{XY} = P_x/P_y$. Thus, every firm increases its production by producing and selling of OX_1 units of X and OY_1 units of Y.

Fig. 10.11



Actually, the for X MRT of Y is equal is ratio of marginal cost (MC_x) of product X and marginal cost (MC_y) of product Y. Means $MRT_{xy} = MC_x/MC_y$. But every firm produces the production where its marginal cost is equal to its market price. Thus for every firm $P_x = MC_x$ and $P_y = MC_y$. So $MC_x/MC_y = P_x/P_y$.

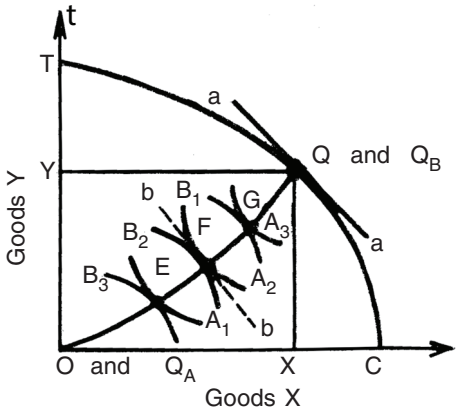
(*iii*) General Equilibrium of Exchange and Production

Now we study general equilibrium of exchange and production under perfect competition. For this it is necessary that the MRS and MRT is equal between two products. Since the ratio of price of two products for consumer and firm is equal in perfect competition, so the MRS of all consumers will equal to MRT. Thus, both products will exchange and produce. Thus, $MRS_{xy} = P_x/P_y$ and $MRT_{xy} = P_x/P_y$. So $MRS_{xy} = MRT_{xy}$.

The general equilibrium of exchange and production are shown in Fig. 10.12. TC is transformation curve for X and Y. MRT (MRT_{xy}) shows by any point on TC curve for products X and Y, where production is in general equilibrium. Take any point Q on TC curve resulting the total production is OX and OY for X and Y respectively. This production determines an Adworth box dimensions for exchange. Drop the line from point Q to X and Y axis. Now O gets original for consumer A which names O_A. Thus Q is original for consumer B which names O_B. Since both the consumer has fixed preference so there is A and B indifference curve. Curve A_1, A_2 and A_3 represents indifference map of A and curve B_1, B_2 and B_3 represent indifference map of B. The tangent point of A and B is E, F and G. To mix these points, there is a transformation curve i.e. Q_AEFGO_B. On this transformation curve every point is equilibrium point for exchange where ${}_AMRS_{xy} = {}_BMRS_{xy} = P_x/P_y$.

Notes

Fig. 10.12



The equilibrium of exchange and production happen where ${}_{A}MRS_{xy} = {}_{B}MRS_{xy} = MRT_{xy}$. This happens when the exchange point F tangent *bb* is parallel to tangent *aa* drawn on curve TC of point Q. But this does not give unique solution. This is so because any tangent drawn on E or G can parallel to tangent *bb*.

10.4 Summary

- The existence of General Equilibrium relates to the behaviour of sellers and buyers and how it affects the demand and supply curves. When demand and supply curve are equal on a positive price, this is equilibrium. This price is called Equilibrium Price. The demand and supply on this price is called Equilibrium Quantity. The excess demand is zero on that price.

10.5 Keywords

- **Excess Demand:** More Demand
- **Excess Supply:** More Supply
- **Multiple Equilibrium:** Fixed and Variable Equilibrium.

10.6 Review Questions

1. What do you mean by existence of general equilibrium?
2. Write comments on The Walrasian General Equilibrium Model.
3. Describe the general equilibrium of exchange (consumption).

Answers: Self Assessment

1.	General Equilibrium	2.	Sellers	3.	Equilibrium	4.	(a)
5.	(a)	6.	(b)	7.	True	8.	True
9.	False	10.	True				

Notes

10.7 Further Readings

Books

1. **Microeconomics—** *Shipra Mukhopadhyay, Annie Books, 2011.*
2. **Microeconomics: An Advanced Treatise—** *S.P.S. Chauhan, PHI Learning.*
3. **Microeconomics: Behaviour, Institutions and Evolutions—** *Sampool Bowels, Oxford University Press, 2004.*

Notes

Unit-11: Production Versus Consumption

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11.1 Thoughts about Employment

11.2 Thoughts about Weakness

11.3 Production Limits the Consumption

11.4 Summary

11.5 Keywords

11.6 Review Questions

11.7 Further Readings

Objectives

After reading this unit, students will able to:

- Study the through about employment.
- Know the thought about weakness.
- Explain production limits the consumption.

Introduction

There are mainly two ideologies in economics. First, the economists of 19th century who think mainly about supply, which is related to production. In this, the main economists were **Adam Smith, David Ricardo, J. B. Say** and others. These economists mainly support to open market means no interference of government. Where the second ideology is of 17th century economists. This ideology was accepted by the 20th centurion economists who were called 'God of Economics'. The analysis of **Keynes** was mainly depended upon demand. Demand is directly attached with consumption. The analysis of **Keynes** was determined the consumption by demand in short time. Means to conclude we can say that one ideology supports supply i.e. production and second supports demand means consumption. It means both ideologies are different.

Notes Demand is directly related to consumption.

Notes

When human takes birth in globe, he has some basic necessities which comes from his desire and desire can be satisfied by consumption of product. **Adam Smith** has written in his book *Wealth of Nation* that economical process draws from money. However, the economists of 19th century thought that supply creates its own demand. In contrast, the economists of 20th century thought that demand creates its own supply. Means both ideologies are on different concepts.

Did u know? When human takes birth in globe, he has some basic necessities.

11.1 Thoughts about Employment

The economists of 19th century knew that if the supply is increased means people will get employment. If production is increased this will eliminate the unemployment problems. However, they regarded unemployment as temporary problem. Means unemployment can be omitted by decreasing rate of wages. In brief, they told that increase of production gives opportunity to people to get employment. In contrast, consumptionist means the economists of 20th century didn't like that theory. They thought that only expanding of production does not end the unemployment. They believed that more production creates crisis in a country. Means the production should be increased only of those products which are in demand. Means products should be supplied as per their demand. They thought that if production increases then unemployment will increase.

Task Give your views on Employment.

Self Assessment

Fill in the blanks:

1. There are mainly ..... ideologies in economics.
2. Demand is directly depend upon ..... .

11.2 Thoughts about Weakness

Weakness means decrease in capital. After the Second World War, the consumption power of people was decreased. Productionists or the economists of 19th century thought that the investment of capital is the way of prosperity. While the economists of 20th century think that destruction of capital is the way of prosperity. Both ideologies support money. Because the economists of 19th century thought that the production can increased by investment of money and by this people can get employment and products. While the economists of 20th century think that capital can increase consumption and this helps to omit crisis and increment of employments. They supported big demand can omit the crisis.

Self Assessment

Notes

Multiple choice questions:

3. The economists of 19th century emphasizes..... .
   (a) on supply (b) on expenditure (c) on buy (d) to sale
4. The weakness means..... .
   (a) shortage of money (b) physical shortage (c) shortage to buy (d) none of these
5. ..... economists knew that supply creates its own demand.
   (a) 20th Century (b) 19th Century (c) 18th Century (d) 17th Century
6. ..... economists knew that demand creates its own supply.
   (a) 19th Century (b) 20th Century (c) 18th Century (d) 17th Century

11.3 Production Limits the Consumption

Productionists means the economists of 20th century think that to care the children, parents expend and they expend on productive products. The market gets products by production and the production occurs for those products which are in desire. However, the supply of all desires is not possible. So production limits the consumption.

Self Assessment

State whether the following statements are True/False:

7. Demand is directly related to consumption.
8. The analysis of Keynes was mainly depends upon demand.
9. 'Wealth of British' is written by Adam Smith.
10. Production cannot possible without consumption.

11.4 Summary

By the above analysis it is evident that consumption and production is not opposite to each other but they are is directly proportional to each other. Because, if there is no consumption, production will not happen and if consumption is not possible without production.

11.5 Keywords

- **Production:** To create
- **Consumption:** Consumption

11.6 Review Questions

1. What do you mean by Production and Consumption? Explain it.
2. "Production limits consumption". Explain it.
3. Give your views on weakness.

Notes

Answers: Self Assessment

1. Two	2. Consumption	3. (a)	4. (a)
5. (b)	6. (b)	7. True	8. True
9. False	10. True		

11.7 Further Readings

Books

1. **Microeconomics: An Advanced Treaties—** *S.P.S. Chauhan, PHI Learning.*
2. **Microeconomics: Behaviour, Institutions and Evolutions—** *Sampool Bowels, Oxford University Press, 2004.*
3. **Microeconomics: Principles, Applications and Tools—** *Sanjay Basotiya, DND Publications, 2010.*

Notes

Unit-12: Economics of Risk and Uncertainty

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12.2 Risk Preference: Attitude Towards Risk

12.3 Gambling

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Objectives

After studying this unit, students will be able to:

- Know the individual consumer's behavior towards Risk.
- Explain about the gambling.
- Study about the insurance.
- Know about the assets portfolio selection.

Introduction

Uncertainty is a factor of human life. So, there is risk in all financial transaction. Wherever, there is uncertainty, there is risk. This is important to know the difference between uncertainty and risk. Risk is a situation, in which the probability of an incident can be measured. On the other side, uncertainty is a situation, where the probability cannot be measured. So, here are one or more incidents in the situation of risk and the risk taker is aware about the all possible incidents and know about the probability of every incident. In the situation of uncertainty, we neither know the right nature of incidents nor can distribute the probabilities. There is uncertainty in the real life and in lots of objects and services, like the investments in share and stock, insurance and gamble etc. So, such decisions would be taken whose result cannot be known prior.

Before the analysis of the theory of risk, it would be beneficial to understand the assumptions that to be used in this experiment.

Notes

Notes Uncertainty is a basic fact of human life.

Probability

The probability of an incident is the ratio of its occurrence (the frequency). It is the ratio of favourable incidents and total number of incidents. Suppose that there is a situation in which any one out of expected results. For example, when a dice is thrown then any one number may be 1, 2, 3, 4, 5 and 6.

For indication,

$$\text{Probability} = \frac{\text{Number of times incident has occurred}}{\text{Total number of possible incidents}}$$

Because turning the dice, it gives possible results 1, 2, 3, 4, 5 and 6, in which the related frequency is 1/6 = 0.167 of any number result that is the probability of every result.

In a special situation, if the all possible results are indexed for incident and the every result is distributed to the probability of incident. Then this is called the probability distribution.

For example, if a coin is tossed and the head is probable to come 0.6 and not to come 0.4, then this shows the total number of probabilities on the incident, if its occurrence or not occurrence is 1 = (0.6 + 0.4).

The index of every result of an incident and its probability is the probability distribution in the form of a table which is shown below—

Table 1

Event Toss of Coin	*Probability of Occurrence*
The state of coming "top"	0.6
The state of not coming "top"	0.4
	1.0

The probable distribution value is necessarily 0 to 1. If the probability is P_i, then $0 \leq P_i \leq 1$, where $i = 1, 2, \ldots, n$.

Did u know? Where there is risk, there is uncertainty.

Expected Value

There are such statically measures for the probability distribution which mainly are available for the brief knowledge about the distribution. One of these is used the probable distribution, expected value or mean average, is the full average of the related value from the several results.

If two possible results are value of X_1 and X_2 and the probability is only P_1 and P_2 of every result then the formula of expected value is

$$\sum_v = P_1 (X_1) + P_2 (X_2)$$

Notes

Suppose that tossing the coin between two players, this is decided that of first time tossing the coin comes head then the player will get ₹ 100 and if comes tail he will have to pay ₹ 60. According to Table 2, the probability distribution is respectively 0.6 and 0.4 then the expected value of this condition is as follows—

Table 2

Incident	*Result*	*Probability*
Win	₹ 100	0.6
Loose	–₹ 60	0.4

The expected value or payment of player is ₹ 36 means.

$\sum_v$ = 0.6 (₹ 100) + 0.4 (₹ 60) = 60 –24 = ₹ 36.

12.1 Individual Consumer's Behaviour Towards Risk

The traditional utility analysation is the behaviour of a consumer in between the risk free and the certain selection. **Newmann** and **Morgenstern** studied the behaviour of a man based on its risky selection of expected utility by gamble, lottery tickets. **Freidman** and **Sewage**, and later **Markowitz** amended the theory implementing in purchasing the insure for risk.

We study the risk preference of a man to understand the individual behaviour for risk.

Self Assessment

Fill in the blanks:

1. Uncertainty is the ..... fact of human life.
2. The difference in Risk and ..... is necessary to know.
3. The uncertainty is the situation, where the possible ..... .

12.2 Risk Preference: Attitude Towards Risk

The attitude towards risk of a man depends on his selections and its expected profit to be received. Generally, this is expected that high risk–high gain. A personal decision shows the risk preference or the attitude of a person and the preferences are different in every individual. Some people like to take risk, some against to take risk and some neutral to take risk. The people, who take risk, expect more return profit, monetary income and utility.

To describe the attitude towards risk of a man, we can present the example of gamble. The players are paid while tossing coin in the gamble. Suppose that a person has ₹ 10,000 and he bet for ₹ 10,000. If he wins the game then he will receive the ₹ 10,000. In reverse condition the amount will be lost by him. This way, both results are expected. Means every result has 50% possibility. In this game the expected value —E_v or payoff is—

E_v = 0.5 (₹ 10,000) + 0.5 (–₹ 10,000) = ₹ 5,000 – ₹ 5,000 = 0. This is a **fair game** of honesty in which the result of expected value is 0.

The attitude towards risk of a man are of three kinds which depend on this factor that the man accept the fair game or not.

Notes

1. **Risk Neutral:** Such kinds of man play if the odds (possibility) are in his favour. If the odds are not in favour then he will not take part and plays the neutral fair game.
2. **Risk loving:** Such kind of man excited to play even if the odds are not in his favour. He will play the game only for ₹ 1,000 possible winning amount losing ₹ 10,000.
3. **Risk Averse:** Such kinds of man will not take part if the odds are not in his favour. But if odds are in favour in full support then he will be ready to play. A risk average person is not ready to play even fair game.

Risk Preference and Expected Utility

Generally, men play in casino to earn more money or betting in race which gives them satisfaction. Economists measure the satisfaction by utility. They describe all the three types of men relating to their risk preference.

Self Assessment

Multiple choice questions:

4. In all financial transactions, there is ..... .
   (a) element of risk (b) element of expenditure (c) element of profit (d) element of loss
5. Attitude toward, risk of a man is of ..... .
   (a) two kinds (b) three kinds (c) four kinds (d) none of these
6. The possibility of incident is the number of occurrences (frequency)–
   (a) ration (b) percentage (c) frequency (d) none of these
7. A risk loving man is ready to play earn odds are not in favor–
   (a) excited (b) depend (c) desperate (d) none of these

Assumptions

The analysis assumes that—

1. The satisfaction of human is linked with money.
2. Utility is a measure of his satisfaction.
3. Man has a certain amount of assets.
4. He plays the tossing coin game.
5. He knows the all probabilities.
6. His selection is definite.
7. He maximizes the expected utility means he opt the payment or expected utility is maximize.

Having these assumptions, think about a gamble, in which a player is paid after tossing the coin. Suppose that a man has ₹ 10,000 and bet on ₹ 5,000. Tossing the coin if head comes, he will earn ₹ 5,000 otherwise coming tail he will lose ₹ 5,000. If he does not bet definitely he will remain at ₹ 10,000. This situation is called certain prospect. But if he bets either on the possibility of winning 0.5 will get ₹ 15,000 (₹ 10,000 + ₹ 50,000) or the possibility of losing 0.5 will get ₹ 50,000 (₹ 10,000 – ₹ 5,000). This situation is called certain prospect. It means that the probability of every result has 50 per cent. In this game the expected value or payoff is—

$$E_v = 0.5\ (₹\ 5{,}000) + 0.5\ (₹\ 15{,}000) = ₹\ 25{,}00 + ₹\ 75{,}00 = ₹\ 10{,}000$$

Now this analysis is linked to utility for every rupee, the expected value is implemented on three types of risk attitude.

Notes

Task Explain your ideas about risk preference.

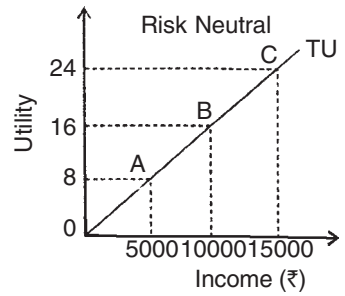
Risk Neutral

The neutral attitude has been shown in Fig. 28.1 about the attitude towards risk in which the money is on horizontal axis in rupees and every expected value linked to utility is on the vertical axis. ₹ 10,000 is with certain odds linked to expected utility 16. For indefinite odds the expected utility is—

$$Eu = 0.5\ (8) + 0.5\ (24) = 4 + 12 = 16.$$

We find the game in risk neutral, the linked utility with certain odds, is equal to the utility linked with its uncertainty odds means 16 = 16. Here both the expected monetary values are equal which described as an example above. Curve TU shows the complete utility which is certainly received by a man from his income. This is a inclined straight rule towards upside in the figure which shows the constant marginal utility of income, as in curve TU, BA and BC are placed at equal distance from centre of dots.

Fig. 12.1



Risk Loving

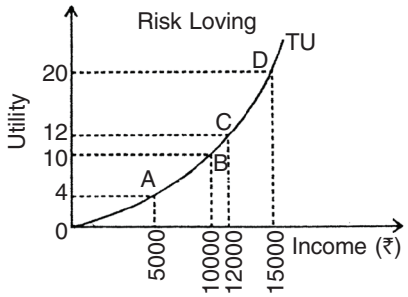
Figure 12.2 shows the risk loving man which TU curve is being inclined upwards which shows the maximum utility of the increasing income ₹ 10,000 the certain odds is linked with expected utility 10 and the uncertain odds linked with the expected utility is–

$$Eu\ 0.5\ (4) + 0.5\ (20) = 2 + 10 = 12$$

When 4 is the result of utility level of ₹ 5,000 and 20 is of ₹ 15,000.

Notes

Fig. 12.2

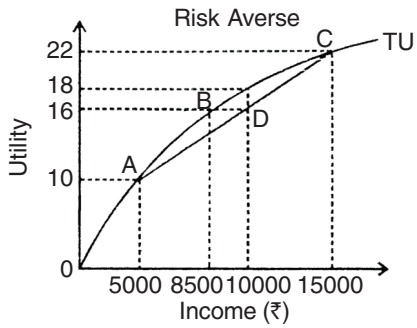


Uncertain odds (12) the expected utility is more than the certain odds (10) the expected utility, means 12 > 10. So this man will prefer (the expected utility 12) with uncertain odds like gamble more than (the expected utility 10) with certain odds. This is the gamble of the TU curve win two utility level game ₹ 12,000. So the risk loving man will play for his certain odds (₹ 10,000) and above ₹ 2,000 (₹ 12,000 – ₹ 10,000).

Risk Averse

The situation of a risk curve man is shown in Fig. 12.3 in which the TU curve is inclined to show the maximum utility from the reducing income. Like ₹ 15,000 is more than 10,000 then 5,000 the maximum utilities is 10 to 8(= 18 – 10) and 8 to 4 (= 22 – 18). So the ₹ 10,000 is the certain odd linked with the utility is 18.

Fig. 28.3



For uncertain odds the expected utility is 16 when the result ₹ 5,000 is the utility level 10 and ₹ 15,000 is 22 is shown falling way—

$$Eu = 0.5\ (10) + 0.5\ (22) = 5 + 11 = 16$$

In this example, the expected utility of uncertain odds is 16 which is less than the certain odds utility (18) means, 16 < 18. The risk averse man will prefer more for low utility uncertain odds than the higher utility with certain odds. This way he will avoid the condition and he will ready to pay ₹ 1,500 which is the difference set by a man for the certain income ₹ 8,500 and ₹ 10,000. This difference is called **Risk Premium**.

Notes

To decide the size of risk, we increase our example and describe this in Fig. 12.3. Point A and C to be net by a line of the TU curve, which is linked with the income utility level of the ₹ 15,000 with 22 utility and ₹ 5,000, with 10 utility. In figure we can see that the expected utility with certainty on the point B is ₹ 8,500 at TU curve. This amount is equal to amount of certainty in the game by the man. Averse but the preference to the utility 16 will ₹ 10,000 certain income as is explained by the drawing a horizontal line to the point B to D on the line AC. Similarly risk premium BD part in the figure is ₹ 1,500. The difference of income is on the equal expected utility 16 on the ₹ 10,000 certain and 8,500 uncertain.

Measures to Reduce Risk

Apart from risk-lovable people, people do not want to take risk always when they face the risk. There are various solutions which reduce the risk among people. The details are—

1. Insurance

People take insurance policy against various risks like death, injury, theft etc. and transfer their risk. The insurance companies take the premium and on the basis of that premium they cover the risk and compensate. The lesser risk taking people buy policies by paying premium to cover their risks.

Think about a man who takes decision to buy policy for loss of house if fire. If the cost of house is ₹ 20,00,000 and the probability to catch fire in a year is 400 (1/400). He has two options — **First**, if he does not take policy and there is no fire then the cost of house remains ₹ 20,00,000 and in case of fire, it is zero. **Second**, if he buys policy and pays ₹ 5,000 to insurance company as premium, then the cost of his house after 8 years, if there is not fire, 20,00,000 – 5,000 = ₹ 19,95,000. If the house destructs from fire then the insurance company will pay him ₹ 20,00,000 as cost of his house.

2. Diversification

Risk can be lowered by diversification. When a firm instead of concerntrating only on one type business and starts running another type of business, then the risk gets lowered. The insurance companies are profit maximization firms. So by just doing a type of insurance, they sell policy for home, health, car, life etc. By diversification in various insurances, they expand their risks. Thus, an investment can lower his risk by diversification in market. By adding various stocks to his portfolio, he can safe from expected loss stocks.

3. Future Market

The people try to reduce their risks by future market. Generally, the future market is present in agricultural products and stock etc. Suppose that farmer grows rice and he does not know that the price of rise would increase or decrease later. He is indefinite about his future and income. So he needs the policy for lower market price. To cover the risk of his future, he signs an agreement with a rice stockist to come with a unique quantity of rice on a special date. If the price of an expected bag of rice is ₹ 300 and the expected high is ₹ 400 then the fair odds delivery price would be ₹ 350. To give the rice on this price, the farmers reduces his risk without taking any risk in future.

Self Assessment

State whether the following statements are True/False:

8. Generally it is expected that the big risk covers big profit.
9. The player pays by tossing the coin in gambling.
10. A risk-loving man does not participate in game if he finds there is no possibility in his favour.

Notes

4. Forward Market

In a forward market, on future date, there is an agreement to give product which is agreed on today. The forward market is for many products like sugar, wheat, tea, gold, silver, foreign currency etc.

Think about a forward market of gold. Its current price (means today's) is ₹ 5,000 per 10 gram. This is called **Spot Price** for urgent delivery. People expect the similar ₹ 5,500 price on next year, which is its **future spot price**. So, gold a person can hedging with a trader against this risk. Suppose that he agrees to sell a kilo gold to a trader on ₹ 5,300 per 10 gm on future price. Therefore, seller reduces his future price to sale at 5,300. So ₹ 200 (₹ 5,500 – 5,300) is like a premium which paid for come out risk of future price. If expected future price is ₹ 5,500 then hedging risk gets profit of ₹ 200 (₹ 5,500 – ₹ 5,300) per 10 gm which is his risk premium.

5. Complete Information

Due to incomplete information people get risk and unstability. He cannot take decision for maximizing. If they do not get complete information, which he wants to sell or buy. In order to minimize the risk of selling or buying full information is necessary. It can be got by different advertisements. Economists called information is a object which can be bought or sold. It has price of information and price of complete information is expected as price of a alternative. It is the difference when information receives completely an expected price when information is incomplete. Take a firm which expends on advertisement and research by which people got information complete its object. So it has probability to increase in selling. Suppose expected profit is ₹ 25,00,000 with complete information but 13,00,000 is the expected price with incomplete. Difference between expected profit with complete information and incomplete information is ₹ 25,00,000 – 13,00,000 = ₹ 20000 which is price of complete information. So, firms earn ₹ 12,00,000 additional profit which is the complete information.

12.3 Gambling

Each person has a simple tendency to earn money without much labour. So, he takes risk and plays gambling in Ramp, Casino etc. We discuss below about coin and its individual behaviour—

Let us discuss about gambling when a coin jumps and a gambler has paid for it. If head has come in first toss then gambler gets ₹ 100/- but he would paid ₹ 100/- if tail is come. Two equal probability is got. Its mean that each has 50% probability. The expected value for this gamble is the sum of the outcomes weighted by their probability.

So expected price = 0.50 (₹ 100) + 050 (– ₹ 100)

= ₹ 50 – ₹ 50 = 0

It shows probability to win that ₹ 100 is 50% and 50% probability in gambling of ₹ 100. It has said fair odds. A fair odd is that whose expected price is 200 or average economic profit is 200. It is also called zero sum game. If 20% probability is to win ₹ 100 and 80% probability is to loss ₹ 100 then it is called unfair gamble. In spite of it, if 20% probability is to loss ₹ 100 and 80% is to coin ₹ 100 then it is called formally gamble.

Now we compare two coin tossing games, in first game, 50% probability to win or loss ₹ 100 and in the game 50% is same probability to win ₹ 200 both are zero Sum gamble but it is more risk in other games . If game has stopped after first toss. The gamble gets ₹ 100 is respect of win loss ₹ 50.

Notes

Individual Attitudes to Gambling

There are three types of behaviour of a person about gambling which depend on accept or reject of favors gambling.

Risk Neutral

A risk neutral person is gambler of playing more and more and whose purpose is to maximize his money by wining gambling. He only thinks about expected value of bet. It is so that when a coin keeps jumping more then average return is its expected value.

It is shown in Fig. 12.4 in which points A and B are equal expected value and they are attracted equally for gambling who play more and more. Suppose gambler has ₹ 100 to bet and it has 50% probability to come head and 50% to tail then point A is expected price of gambling.

$$E_v = 0.50 (₹ 100) + 0.50 (₹ 100)$$

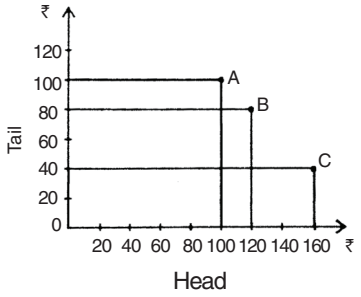
$$= 50 + 50 = ₹ 100$$

Expected value of gambling at point B

$$E_v = 0.50 (₹ 80) + 0.50 (₹ 120)$$

$$40 + 60 = ₹ 100$$

Fig. 12.4



Therefore, on point C and on other points if he continues to jump the coin then the average will ₹ 100.

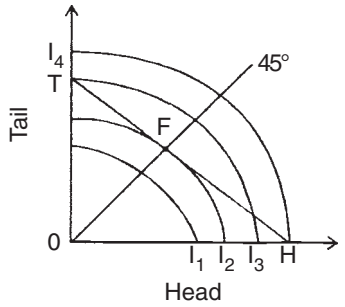
A risk neutral gambler is neutral on fair odds. It is because he can differentiate in risk of gambling and in long run, he will win expected price. He will play on favourable odds and will not play on unfavourable odds.

Risk Loving

A risk loving person is ready to play gambling even if probabilities are not in his favour. It will like high risk alternatives of gambling of equal expected value. He will take risk even he looses, even when it is not in his favour. It is shown in Fig. 12.5. Where concave neutral curve of gamblers are I_1, I_2, I_3 which show different alternatives of choices. For TH line (Budget line) it is its money.

Notes

Fig. 12.5



F is a point of fair odds on which his budget line TH touches on neutral I_2. Gambler will not take chance on fair odds if he is risk loving. But he will always choose tough solutions. If he takes bet on tail and after jump coin it comes head then that point will H and he will lose all money. In other side, if it comes tail then it will on point P and will on money of bet.

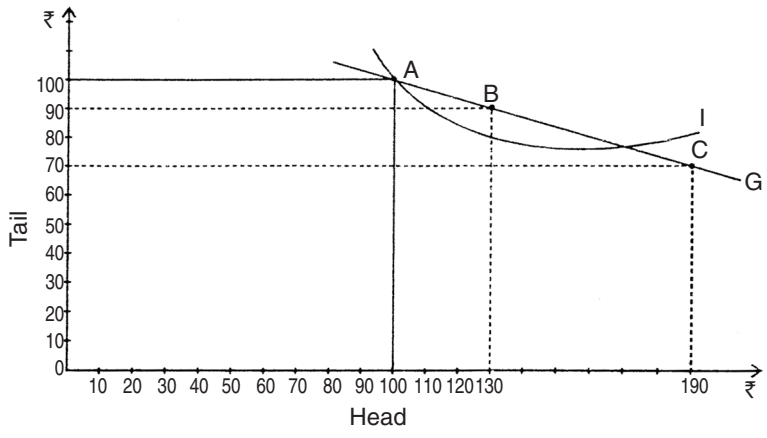
Risk Averse

A risk averse is that person who will not take risk even in fair odds. But he will gamble if probability is in his favour. Suppose that he come with ₹ 100/- and he has 3 to 1 probability to toss the coin, then will lose ₹ 10/- if it comes tail and if it comes head he will win ₹ 30.

See Fig. 12.6 where head on horizontal axis and tail on vertical axis. It he on fair odds (1 by for 1), give chance to jump coin then he will not take chance and will remain on point A. He has ₹ 100/- and it will be secured. It is neutral curve I of A is decline on (1) which it cross Budget times.

Suppose that he is said to take risk on favourable odds 1. To take bet of 10/-, he come on point B which he likes point A of his budget point. It is better situation for him because he profits ₹ 30/-. His money increases from 100/- to 130/-.

Fig. 12.6



Now, suppose that according to casino rule, get bet of ₹ 30 or not any. In this situation the bet of ₹ 30/- points A goes to C which is not favourable for him because it is situated below its neutral curve. He will not take risk of ₹ 30 for profit of ₹ 90 and get refused to take set. Therefore, risk averse persons, even probability is in their favours, will take gambling.

Notes

12.4 Summary

- Behaviour of a man to risk depends on his selection and expected profit received by them. Generally, it is expected that with great risk there will more profit. Any individual decision shows their behaviour and risk taken by them and risk ability are different in each person. Some people like to take risk. Some oppose to take risk and some keep neutral to risk. Those who take risks expect to get more return, profit, income and prices.

12.5 Keywords

- **Probability:** Possibility
- **Expected Value:** Expected value in money

12.6 Review Questions

1. What should the behaviour of a consumer for risk?
2. What is Risk Preference? Explain it.
3. Express your opinion about Gambling.

Answers: Self Assessment

1.	Fundamental	2.	Uncertainty	3.	Measured	4.	(a)
5.	(b)	6.	(a)	7.	(a)	8.	True
9.	True	10.	False.				

12.7 Further Readings

Books

1. **Microeconomics: An advanced treaties —** *S.P.S Chauhan, PHI Learning.*
2. **Microeconomics: Behaviour, Institutions and Evaluation —** *Sampoole Bowels, Oxford University Press, 2004.*
3. **Microeconomics: Principals, Applications and tools —** *Sanjay Basotiya, DND Publications, 2010.*

Notes

Unit-13: Insurance Choice and Risk

CONTENTS

Objectives

Introduction

13.1 Insurance

13.2 Choice between Insurance and Gambling: Friedman-Savage Hypothesis

13.3 Asset Portfolio Selection

13.4 Summary

13.5 Keywords

13.6 Review Questions

13.7 Further Readings

Objectives

After studying this unit, students will able to:

- Know about insurance.
- Select between insurance and gambling.
- Know asset portfolio selection.

Introduction

An insurance company takes risk of the death of his customer that if he dies then it would pay a big amount to his family. When an insurance company sells insurance policies then it covers more than hundreds of families.

13.1 Insurance

There are two characteristics to decrease risk—**first**, in the view of that person who buys insurance policy and **second**, in the view of insurance companies who sell insurance policy.

1. From the Viewpoint of Buyer of Insurance

Insurance is opposite of gambling. It lowers the risk. When a person buys policy for himself or to protect his dependents or to protect his property from accident, fire, theft etc. unknown incidents, then he lowers the risk. There is the market of policy because people are risk averse.

Notes

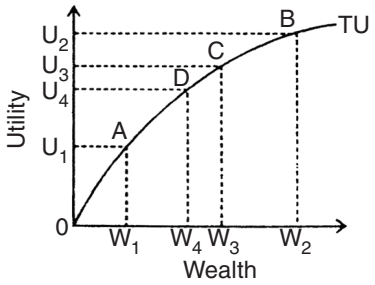
Just think about a person who has a bike of ₹ 50,000. He buys a policy of ₹ 5,000 for protecting his bike from theft, accident etc. He assumes that the probability of theft is 0.1 and expected loss is ₹ 5,000 (= 0.10 × ₹ 50,000). Since the cost of policy ₹ 5,000 is equal to expected loss ₹ 5,000, so he will buy policy to get rid from risk that if the bike has stolen he can get the full amount of bike.

The risk averse people has two options—(1) if he does not take policy then the probability of fault is 0.1 means ₹ 5,000 (2) If he takes policy then there is no scope of loss of ₹ 50,000. He pays ₹ 5,000 as policy premium and gets profit of ₹ 45,000 as 0.9 probability. A risk averse by doing this kind of action, got ends the risk. But an insurance company wants to get profit. So it does not imply the fair laws as stated above. It takes more premiums, let's assume ₹ 5,500. ₹ 500 is its cost and it is actually its profit or income.

Like all persons, a risk averse person has also marginal utility of capital. When he buys a insurance policy after the probability of 0.1, he thinks the risk low amount as decrease of his wealth.

This is shown in Fig. 13.1 where capital which is the current value of bike shown on vertical axis. If bike has stolen then point A shows ill-less result with capital W_1 and utility U_1. If bike has not stolen then point B shows ill-less result with capital W_2 and utility U_2. When he buys insurance and insurance company takes a premium (means ₹ 5,000) then he will be on point C with capital OW_3 and utility OU_3. As a result, his capital decreases form OW_2 to OW_3. But when the insurance company takes extra premium (₹ 500) to cover their risk then this opposite policy is as point D, by which his capital decreases by OW_4 and utility by OU_4. This represents the decrease marginal utility of capital when risk averse person buys an opposite insurance policy.

Fig. 13.1



2. From the Viewpoint of Insurance Company

The work of insurance company is to fill the loss due to any accident. It decreases the loss by taking a small amount as premium amount and that for accident, which policy covers; it delivers to pay a big amount to his customer. Since more people are risk averse, they even ready to pay premium in odds situation. Thus, the insurance companies are also risk averse. They also want to get profit like firms. To get rid from risk and to get profit, they use risk pooling and risk spreading concept.

Self Assessment

Fill in the blanks:

1. In front of risk averse ..... .
2. There is the market of policy because people are ..... averse.
3. An insurance company takes the risk of his customer's death with ..... .

Notes

Risk Pooling and Risk Spreading

An insurance company takes the risk of his customer's death with little premium and if he dies, it will pay a big amount to his family. It can do very simply by collecting the risks of his customer. When an insurance policy sells the policy then it is not insured a single person but more than thousands people. It knows that the entire insured person will not die at all except atom war or epidemic. Some persons can die soon, some in the period of insurance and some will not die after policy matures. So they know geometrically that the premiums, which they collect from his customers, are more than the payment given to their customers. In other words, as much as it insured, the ratio of people would low who actually died annually. It is called **Law of Large Numbers**. It means as much as the insured person, for insurance companies, the average result will more forecasted.

Thus, the insurance policy can assume the risk and for profit, it can calculate on the premium amount collection from customer. Risk pooling, in a large amount of people, can possible only by risk spreading. It does not only mean that the quantity of insured person should high. It also means that the risk should independent from the risk covers by all people. Suppose that in a house, an insurance company insured policy for 100 people. If a big fire comes, then all houses can burnt. The company will get a big loss. In this condition, the risk of fire is not independent. Now if the similar company insured different houses then the risk is independent. There is the possibility to burn a single house rather than 100 at a time because a fire at one home is independent from another home. On the basis of this independent risk, various insurance companies do not cover war, flood, and earthquake like situations because if it happens, the risk is very wide.

Another method is diversification by which insurance companies widen their risk. They do various types of insurance like life insurance, house insurance, car insurance, medical insurance etc. to cover this.

Notes Insurance is opposite of gambling. It lowers the risk.

Risk Sharing

Risk sharing is another form by which the insurance companies use to cut their cost of risk. The risk sharing happens when a person insured with a huge amount and if there is an accident, then the claim would waste to a company. This situation is related to a specific skilled person who insure a part of his body only. For example, to insure her voice by Lata Mangeshkar or Madonna, an artist from a bad incident which can stop him to act, etc. Since one person is insured for a big money, the premium is also huge. If nothing happens to that person, then company will get a huge profit and if anything happens badly then company will get a big loss.

In this situation, the insurance company opts risk sharing which is also called re-insurance. When company insures a person's skill, then by dividing this into sub policies, shares the risk from other companies. Every company gets a part of premium and the claim is also divided equally if the accident happens. The big example of risk sharing is the **Lioyd's Insurance Market**, London. Thousands of syndicates and insurance companies are its associate and every syndicate is further divided into 20 associates. Thus, by the risk sharing, a big money is divided and risk gets lower. By dividing the premiums in syndicates and its associated, if the risk happens, the payment is very low.

Problems of Insurance

There are two main problems which insurance companies face. These are moral hazard and adverse selection which described as follows—

Notes

1. Moral Hazard

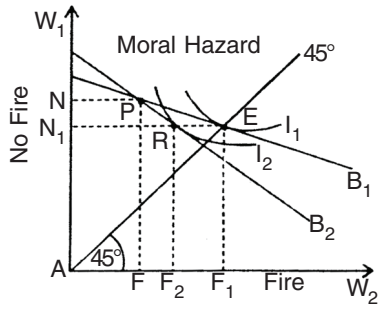
This situation exists when a person, who is insured for illness, fire or car accident, behaves as the chances of that incident become higher. In this situation, the loss is shifted from person to insurance company and bears the big payment. Moral hazard happens when a person is speeding with his car or does not lock from the theft and it increases for the accident or theft. Thus, home owner or firm does not put fire system after fire insurance which increases the risk of fire. For health, an insured person gets chain smoker and gets higher of his risk of illness. As these types of situation, the behaviour of policy taker does change. He takes more risk than cover a policy.

The insurance policy does not give premium in favourable or fair odds due to moral hazard. It includes some unique behaviour to protect or lower the moral hazard. For example, an insurance company can sell policy to a firm or a home owner if the fire system is used; a person gets life insurance if he does the annual checkups; and the premium can increase for multiple accident drivers. Thus the insurance companies can decrease the number of payments by lowers the possibilities of fire, illness or accident. They can present various agreements to various customers. High premium is taken from high risk people and they get full protection, while low premiums are taken from lower risk people and they will get only partial protection.

Think about a people whose cost of house is W. If it catches fire then his money only $W_2 = W - d$, where d is wastage of his house. If that person gives α_1 premium and insured his house from fire then he will get α_2 payment if house catches fire. If no fire then his money will $W_1 = W - \alpha_1$ which is insurance premium which he pays. If it catches fire then his money will $W_2 = W - d + \alpha_2$.

An insurance company due to risk averse, to decrease the moral hazard, presents his customer to some less favorable odds. This is shown in Fig. 13.2. Point P represents the cost of his house without any insurance. In the situation of fire, his money will decrease till OF. It assumes that the possibility of situation of fire from situation of fire is multiple of three times means 3:1. This indicates by the sloping of his budget line B_1 which gives possibility of 1/3 (3 to 1). Now assume that the home owner gets insurance policy. To assume that fire happens from possibility 1 to 3, he selects point E on which his budget line B_1 touches indifference curve I_1. Point E is risk free point for home owner which is with 45 degree line because $\alpha_1 = NN_1$. After paying the policy premium, his money is $W_1 = W - \alpha_1$ or $ON_1 = OF_1$. So he does not think about fire and here the possibility of fire is maximum. Please note the 45 degree line has $W_2 = W$ or $W - d + \alpha_2 = W - \alpha_1$, so the payment of insurance company covers only the losses of home if fire catches. Thus the insurance policy will never present him to possibility 3 to 1. This condition is shown in Fig. 13.2. The equilibrium point of home owner is R on which his budget line B_2 touches his indifference curve I_2. On this R point, he pays NN_1 premium but if catches fire, he will get payment lower insured money OF_2 rather than old insurance money OF_1.

Fig. 13.2



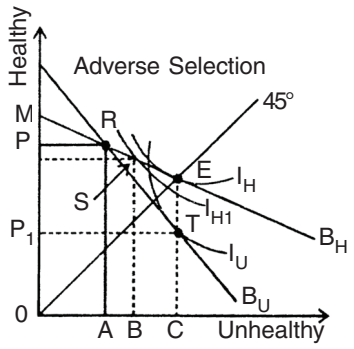
Notes

2. Adverse Selection

When insurance company knows less for the future incidents from the customer, then it creates adverse selection like personal illness insurance market. In this, the person knows more from the insurance policy, which however check his health while insured him. So the insurance company takes premium on the basis of national average. He will motivate more ill people to get insured than less fit people. On the other hand, fit people thinks that he is about to pay more against his low individual risk. Other hand, the ill people think that he is paying fewer premiums against his high risk. As a result, the higher risk people buy more insurance while lower risk people do not buy insurance. This is the problem of adverse selection which will bankrupt the insurance companies. This condition makes the high premium in insurance and thus the ill people stop getting insurance because they think that the individual payment is lower than policy premium.

To getting rid from this adverse selection problem, the insurance company gets various premiums on the basis of various age limits and the nature of risk for industries. Thus the premium amount is more for high risk people than the low risk people. To solve the adverse selection, the insurance company fixes the rate for both the groups as shown in Fig. 13.3. Every person has OM money which is less in case of illness till OA. The illness possibility for fit people is 3 to 1 or 0.25 and ill people have 1 to 1 or 0.50. On this assumption, the budget line for fit people is B_H which touches their indifference curve I_H on point E and ill people has B_U line which touches their indifference curve I_U on point T. According to insurance company, the fit people should take insurance policy on T point with 3:1 possibility and ill people should take policy on point E with 1:1 possibility. But the insurance company cannot give two different policies because it cannot differentiate between these two groups. So it collects similar premium from both groups. As a result, ill people will get policy on point E with 3:1 possibility and when company needs to pay OC amount as payment and it will bankrupt the company. In this situation, company gives two options. One, for fit people on 3:1 possibility, it will take MP premium. They will be on I_{H1} curve on point S which touches his budget line B_H. If illness happens, the company will pay OB money to this group. Second, for ill people it will take MP_1 premium on 1:1 possibility on point T and will pay OC money to this group. This result is only possible equilibrium. It can possible if insurance company can know about the fit and ill people by repetitive medical tests and past health history.

Fig. 13.3



Did u know? The work of an insurance company is to give decisiveness to any loss incident.

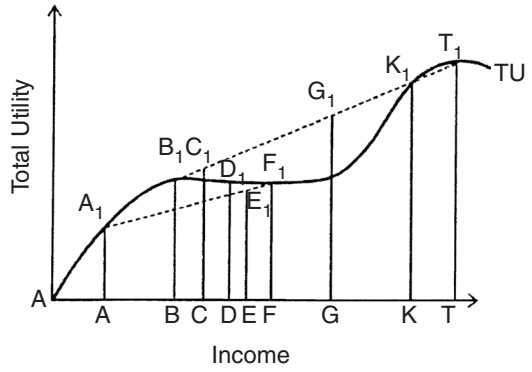
Notes

13.2 Choice between Insurance and Gambling: Friedman–Savage Hypothesis

Some people are risk averse and they spend their life to review their insurance protection and involve in gambling in casino. This is a paradox because it indicates that people can be risk averse and risk loving at a time. In fact, there is no paradox because the behaviour insurance which can be bought depends upon their nature and cost as well as the game of gambling.

If a person buys an insurance policy then he wants to get rid from risk. But when he buys a lottery ticket then he gets small occasion of big profit. Thus, he takes risk. Some persons take in both insurance and gambling and thus they take risk and protect too. Why? Answer has given by **Friedman–Savage Hypothesis**. It tells that for income the marginal utility comes down on a level. It increases between a level of income and any high level and again decreases for all income over that upper level. This is shown in Fig. 13.4 as total utility curve TU where utility is shown on horizontal axis and income is on vertical axis.

Fig. 13.4



Suppose that a person buys insurance policy to protect his house from fire and he also buys a lottery ticket which gives a small occasion to him for a big deal. This paradox has shown by a total utility curve by Freidman and Savage. This type of a curve primarily goes upward in decreasing rate by which the marginal utility of money gets low and then it gets upward in increasing rate by which the marginal utility of money gets high. In Fig. 13.4, TU curve first goes downward to point F_1 and later goes upward till point K_1. Suppose that the income of a person **without fire** with FF_1 utility is OF. Now he buys policy to get rid of risk of fire. If fire catches the house then his income will decrease by OA with AA_1 utility. By adding point A_1 and F_1, we get utility points in these two unknown income condition. If the possibility of **non fire** is P then the expected income of this person is

$$Y = P\,(OF) + (1 - P)\,(OA)$$

Suppose that the expected income of person is (Y) OE then its utility is EE_1 on pointed line A_1F_1. Now suppose that the cost of insurance (insurance premium) is FD. Thus the income with insurance is OD (OF – FD) which gives his more utility from EE_1 to DD_1 in case of no fire possibility expected income is OE. So that person pays FD premium to get fixed income OD in case of fire and to get rid of risk.

After taking insurance for fire protection, he decides to buy a lottery ticket with rest of his income OD whose price is DB. If he will not win then his income will fall by OB with BB_1 utility. If he wins then his income will rise by OK with KK_1 utility. Thus his expected income with possibility of not winning lottery P^1 is—

$$Y_1 = P^1\,(OB) + (1 - P^1)\,(OK)$$

Notes

Suppose that the expected income of person is (Y_1) OC then his utility is CC_1 on pointed line B_1K_1 which gives him more utility (CC_1) while buying lottery ticket which is more than DD_1 utility of not buying ticket. Thus, the person will buy lottery ticket with premium pay for fire protection of his house.

Now we suppose expected income OG from the upper part F_1K_1 of TU curve when the marginal utility is rising for income. In this condition, the utility of lottery ticket is GG_1 which is more than DD_1 if he does not buy lottery ticket. So he will put his money in lottery ticket.

In the last stage when expected income of person is more than OK in K_1T_1 region of TU curve, then the marginal utility gets low and hence he does not get involved in any favorable odds like lottery tickets.

Self Assessment

Multiple choice questions:

4. Insurance Company do ..... in risk.
   (a) partnership (b) stake (c) buy (d) none of these
5. Every company gets ..... of premium.
   (a) two part (b) one part (c) three part (d) none of these
6. The big example of risk sharing is the Lioyd's ..... London.
   (a) stake (b) market (c) insurance market (d) none of these
7. High risk people get insurance ..... .
   (a) more (b) less (c) lessen (d) none of these

13.3 Asset Portfolio Selection

An investment does not only think about the security of his asset but he also thinks to get more expected income and lowers the risk too. This depends on the portfolio selection of asset which he has or he has selected. A portfolio is a group of many stocks like share, bond, security, treasury bill etc. It can be stock or can be business in market. These all assets are risk covered because the future result is unknown of these. In other words, the result of these cannot get same as calculated. The real result can differ from assumption. So the risk can say as loss or change. Thus the risk is related to variability or dispersion of expected returns.

For an investor, the return from his asset like profit margin, interest, bonus is **expected cash inflow**. The return can profit or loss in percentage in capital money. The current expected price of this return is expected profit of stock person.

Mean Variance Analysis

The rate of portfolio of an investor is the average of rate of gaining individual investment. Weight is percentage of total portfolio. The expected received rate for portfolio can be given like—

$$E_{Ri} = (\alpha)^2 \sum_{i-1}^{n} W_i R_i$$

Where W_i = percentage of portfolio in asset *i*

R_i = expected rate of return in asset *i*

Table 1 shows the expected rate of 4 risk assets.

The expected rate of return for this portfolio of investment is 12 percented.

If the expected return rate has given, then a risk of investor can be measured by standard deviation or variance of expected return. This is change of expected rate of return (R_i) on farm of expected rate (ER_i)—

Notes

Standard deviation $(\sigma) = \sqrt{\sum_{i=1}^{n} (R_i - E_{Ri})^2 P_i}$

Where P_i is expected rate of return and the possibility of R_i. Variance is the class of standard deviation.

Variance $(\sigma)^2 = \sum_{i=1}^{n} (R_i - E_{Ri})^2 P_i$

Table 1: Expected Rate of Return for a Portfolio

Number of Assets (1)	W_i (2)	R_i (3)	$W_i \times R_i$ (4)
1	.10	.10	(.10 × .10) = .010
2	.20	.11	(.20 × .11) = .022
3	.30	.12	(.30 × .12) = .036
4	.40	.13	(.40 × .13) = .052
			E_{Ri} = .120

Risk asset portfolio standard deviation and variance table of receipts has been calculated based on the assumption of table 2 that (1) are identical possibility P_i = .02 and (2) the expected rate of return R_i = .12.

The table shows that standard deviation of a risk covered portfolio is .2 and its variance is .0004 when expected rate of return is .12 and possibility is .20.

Selection of an Efficient Portfolio – The Markowitz Portfolio Theory

The selection of an efficient portfolio means an investor should select a portfolio by which he can get maximum profit with low risk. The **Markowitz Portfolio** theory indicates that how an investor can take an optimum portfolio under risk. **Prof. Harry Markowitz** was the first economist who proposed original portfolio model in 1952. A portfolio of assets in its model to achieve the required rate and expected rate of return standard deviation of (or variance) required as a measurement of derivative risks. The standard deviation of a portfolio is not a calculative result of individual investment but it is a covariance between expected rates of return for all pairs of portfolio. Markowitz has shown the diversification of a portfolio to lessen the risk.

Its Assumptions

The **Markowitz** model is based on following assumptions—

1. An investor is risk averse.

Table 2: Variance of a Portfolio of one Risky Asset

Possible Rates of Return	*Expected Rate of Return*	$R_i - E_{Ri}$	$(R_i - E_{Ri})^2$	$Pi\ (R_i - E_{Ri})^2 P_i$
.09	.12	–.03	.0009	.20 .000180
.11	.12	–.01	.0001	.20 .000020
.13	.12	.01	.0001	.20 .000020
.15	.12	.03	.0009	.20 .000180
				.000400
Standard Deviation = $\sqrt{.00040}$ = .02				
Variance $(\sigma)^2$ = .0004				

Notes

2. He estimates the risk of portfolio by changing in expected rate of returns.
3. He thinks all investment are is expectedly declared with investment options.
4. He maximizes a time for expected utility.
5. The utility curve of an investor shows the decreased marginal utility of money.
6. The decision of an investor for portfolio is based on expected returns and risks.
7. The utility curve of investor is result of standard variation of returns and variances of expected returns.
8. In a given level of risk, an investor gives preference to higher returns rather than low.
9. He gives preference to lower risk than higher for getting a level of expected returns.

Self Assessment

State whether the following statements are True/False:

8. A portfolio is not a group of many stocks like share, bond, security, treasury bill etc.
9. The risk is related to variability or dispersion of expected returns.
10. Weight is the percentage of total portfolio.

The Model

On the given assumption, suppose that investment has many assets available on which he can invest. There may be two combination of assets in portfolio. Every combination has a level of risk and expected return. An investment chooses minimum risk or maximum risk portfolio. It depends as what he wants to expect from his investment and how much he wants the risk. So in given two combination of assets portfolio, investor selects the best portfolio. For selecting the best portfolio, investor has two decisions— **One**, determination of efficient set of portfolio, and **two**, to select best or optimum portfolio from this efficient set of portfolio.

Task Give your thought on gambling and insurance.

The Efficient Set and Efficient Frontier

The efficient set of portfolio of asset is good if it gives higher expected returns or minimum risk on this higher expected return. In other words, a portfolio is efficient if another portfolio gives similar risk and higher returns or higher returns on minimum risk. It is shown in Fig. 29.5 where a standard variation (σ) of a portfolio of asset is shown on vertical axis which measures the risk and the expected returns of portfolio (E_R) is in horizontal axis. Whichever is with point region ENMF, efficient portfolio and this region EF is called **Efficient Frontier**. A group of portfolio on which every risk level expected return is higher or the risk of expected return is lower is called **Efficient Set**. The group efficient portfolio is **Efficient Portfolio**. This is the only portfolio which a risk averse person will opt. Suppose that the level of risks r_2, there are two portfolios K and M. From these, M is an efficient portfolio because for the given level of risk r_2, the expected rate of return is r_2 M is higher and it is on efficient region EF. Thus from N and K portfolios, N is efficient portfolio because its risk r_1 is lower while r_2 risk of portfolio K is higher. But the expected returns level of both are OR. So he would select N portfolio.

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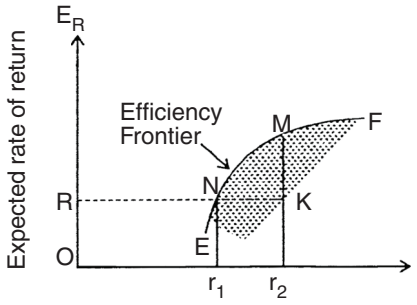
Fig. 13.5

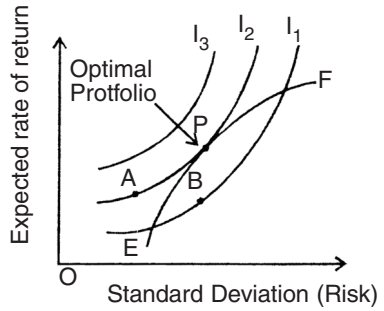


The Optimal Portfolio

In efficient frontier, the investor will opt that portfolio in which risk return preference is higher utility from various possible portfolios. Because risk averse investor thinks expected returns "good" and risk (σ) as "bad". His preference indicates by indifference curve from various portfolios. To determine the efficient frontier, these indifference curves determine which efficient portfolio he selects. That is optimal or best portfolio.

Figure 13.6 shows three indifference curves I_1, I_2 and I_3. The upward slope from left to right indicates risk covered exchange. Curve I_2 shows more preference than curve I_1 and curve I_3 shows more than curve I_2. EF is efficient frontier. P is optimal portfolio point where curve EF touches curve I_2. Point A is also on I_2 curve. But this is not the point of **optimal portfolio** because it is outside the efficient frontier. Again point B on I_1 curve is not optimal portfolio because this gives preference of minimum risk to investor. Thus P is optimal portfolio because it is on the tangent point of maximum risk preference I_2 curve and efficient frontier EF.

Fig. 13.6



Risk Reduction through Portfolio Diversification

An investor can reduce his risk of investment in stock market by risk diversification. The meaning of diversification is to expand his investment into two or more than two assets or shares. This is like "not

Notes

all eggs in a bucket". To reduce the risk, investor makes diversification as a condition on his portfolio. To understand the portfolio diversification, an investor has ₹ 100 to invest in two risk asset shares BP (Bharat Petroleum) and SAIL (Steel Authority of India Limited). The price of unit per share is 1. The profit and loss is 50 percent from both the shares.

Now suppose that he invests all ₹ 100 to buy share of BP. This gives him ₹ 10 profit and ₹ 2 in crisis. Rise and fall of 50-50 percent occasion, the expected average return of him is -

$$E_R = .5 (₹ 10) + .4 (₹ 2) = ₹ 6$$

The variance $(\sigma)^2 = .5 (10 - 6)^2 + .5 (2 - 6)^2 = ₹ 16$

Suppose that he invests ₹ 100 in share of SAIL. He expects ₹ 2 in rise and ₹ 10 in crisis. Rise and fall of 50-50 percent occasion, the expected average return of him is –

$$E_R = .5 (₹ 2) + .5 (₹ 10) = ₹ 6$$

The variance $(\sigma^2) = .5 (2 - 6)^2 + .5 (10 - 6)^2 = ₹ 16$

Thus, the expected return from both the shares is ₹ 6 per share and variance is ₹ 16 per share. It shows that the risk and expected return is similar by investing two independent shares. But there is a main difference between these two investments. The expected return of BP share is high in rise and low in crisis. But with shares of SAIL, it is opposite.

This combination of share is not useful for investors because the risk and returns for both the shares are equal. This is so because the returns are not independent. But there is a negative correlation in them. When one gets higher then second gets lower and vice versa.

An investor can reduce the risk by taking some shares without change in expected returns. It is called **diversification through risk pooling**. Suppose that an investor invests ₹ 50 in shares of BP and the same amount in share of SAIL and thus he diversifies his investment. Now he will get ₹ 5 from BP share and ₹ 1 from SAIL share in rising. The average return is ₹ 6. He will get ₹ 1 from BP share and ₹ 5 from SAIL share in crisis which again gives him the expected return of ₹ 6. Thus however rising or crisis, the expected return is still ₹ 6. By getting ₹ 2 or ₹ 10, he is now relaxed with getting returns as ₹ 6 chances are 25 percent and ₹ 6 Expected average 50 percent chances of recovery.

Risk diversification works only when the returns of share is independent from each other and correlated positively means two assets go into one direction.

Measuring Market Risk and Specific Risk

A portfolio owner has two types of risk – Market Risk and Specific Risk. Market risk is related to gaining of a unique share when all stock market are in motion from upward and downward. The specific risk is related to getting the shares from many companies which is risk pooling and diversified, while market cannot risk diversified because the returns of shares in share market comes up and down simultaneously.

Economists use a coefficient Beta to measure that quantity whose work is related to motion to get a unique share. If a share moves on the similar direction where there is a market index, then its Beta will be 1. One high Beta share (Beta >1) means it moves in the similar direction where market is. But it is good when market is rising but it is bad when market is in crisis. Between 1 and 0 share, Beta means share works in the similar direction as market but in very lazy condition. A negative Beta share moves in opposite direction from nature of market.

Most of the shares move in the market direction and its **Beta** one (1) nearer **Beta**. But the negative Beta shares give preferences by investors because it decreases the risk of portfolio. Low Beta and negative Beta share also collect the risk of portfolio. But the high **Beta** share should avoid because it moves into market direction, the returns of its is more and it cannot be used to collect portfolio risk.

Conclusion—The characteristics of risks of share and its returns cannot divide from the nature of

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market in a portfolio. This is the reason to use **Beta** by economists. If Beta of a share is lower than 1 then it will decrease the risk of risk portfolio even these **Beta** share are individually risky. But if it collects with other shares then portfolio will lessen the risks. So it should give preference from **Beta** shares by risk averse investor.

Thus, in stock market equilibrium, low **Beta** shares should be available in low return and high value. On the other hand, high **Beta** share increases the risk of portfolio and can buy when it has high average return rate for lower price and to compensate of high risk.

13.4 Summary

- The work of insurance company is to fill the loss due to any accident. It decreases the loss by taking a small amount as premium amount and that for accident, which policy covers; it delivers to pay a big amount to his customer. Since more people are risk averse, they even ready to pay premium in odds situation. Thus, the insurance companies are also risk averse. They also want to get profit like firms. To get rid from risk and to get profit, they use risk pooling and risk spreading concept.

13.5 Keywords

- **Return:** Return
- **Portfolio:** Bag of keeping paper
- **Distribution:** Distribute

13.6 Review Questions

1. What do you mean by insurance? Explain it.
2. Write comments on gambling.
3. Explain the Asset Portfolio Selection.

Answers: Self Assessment

1. Two Options	2. Risk	3. Premium	4. (a)
5. (b)	6. (c)	7. (a)	8. False
9. True	10. True		

29.7 Further Readings

Books

1. **Microeconomics —** *Robert S. Predik, Daniel L. Rubenfield and Prem L. Mehta, Pearson Education, 2009, PBK, 7th Edition.*
2. **Microeconomics —** *David Basenco and Ronald Brutigame, Wiley India, 2011, PBK, 4th Edition.*
3. **Microeconomics —** *Shipra Mukhopadhyay, Annie Books, 2011.*

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Unit-14: Economics of Information

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14.2 Asymmetric (or Imperfect) Information

14.3 The Efficient Market Hypothesis

14.4 Summary

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14.7 Further Readings

Objectives

After studying this unit, students will be able to:

- Know the theory of search.
- Study the asymmetric information.
- Know the efficient market hypothesis.
- Explain the market indications.

Introduction

Consumer, producer and owner of factors know the status of market under perfect competition. On this assumption, that they are prudent. It assumes that they know the process of market. **Joseph Stiglitz, Michael Spence and George Akerlof**, who received the Nobel Prize in 2001 in Information Economics, have established that the information of market is actually unreal or insufficient in real life. But in this field, **Prof. Stigler** has done tremendous work in his book "*The Economics of Information*" in 1961, which gave supports to economics to gain information. In this unit we will learn the theory of asymmetric information and efficient markets.

14.1 The Theory of Search

The theory of search which was proposed by **Stigler** in 1961 has made various changes by **Rothschild, Nelson, Salop, Stiglitz, Varian** and other economists. Following are the definitions of some models–

Notes

Stigler's Model

In his column, "The Economics of Information" published in 1961, **Stigler** has shown that in market, a product has limited or faulty information. The classic models of consumer behaviour believe that information is full and consumer knows the minimum price of a product which he needs to pay. But it is unreal because the consumer does not have any such information. According to **Stigler**, there is a 'uniformed buyer' for a unique product. For example, if consumer buys an unique camera, then he does not know, which shop is selling in its minimum price. He does not certify that which shop is selling in its minimum price or what is its minimum price until he collects information in market or goes shop to shop.

Prof. Stigler gives his analysis by saying that **price dispersion** is 'measurement of 'lack of knowledge' in market. Price Dispersion happens with homogenous products. By this a ignorant or unnoticed buyer searches the minimum price of a product in market.

Its Assumptions

The information of search of **Stigler** is based on following assumptions:

1. There is unlimited information in market. The buyer has limited but seller has full knowledge about a product.
2. The buyer has full knowledge of a limited region of a market.
3. He knows how the price is distributed and what it can be done. But does not know which shop takes what prices.
4. The buyer has nothing but to get information in market for the minimum priced shop.
5. He went to a fixed number of shops and buys the product on shop which sells in a minimum price.
6. The cost of search is stable in the view of time and conveyance.

The Model

After giving this assumption, the main problem is that the consumer will go to how many shops or get information from how many number of shops?

In **Stigler's** model, the shop which takes minimum price in a region of market is "unknown truth of world." After visiting various shops, the price which buyer gets is an indication. Both unknown truth (shop) and indication (price) are related probabilities that an indication is lower than the minimum (price). Thus the buyer knows this probability that the searched price is lower than any minimum. This happens due to uncertainty of market and the buyers are uncertain from the prices taken from various shops.

When buyer fixed a price then he selects the number of shops which he wants to go, and which is based on various things along with the cost of information. The cost of information is time. The information of search is also affected by the geographical area of market. If the market is big, then cost of information will be high. A buyer who goes to a big market for information, the budget of his search will big and he would go in little number of shops. If the market is small and the need of time is low then his cost of search will low and he will go in many shops.

The optimal search is also based on the return of information of buyer. Expected profit is expected loss. Generally, if a buyer expends a big money in a unique product then the search will give him expected profit. He will give more time for search.

Thus, the decision rule for definite search by **Stigler** is the buyer fixed the number of shops for information by the cost of expected profit by search. The buyer will search until the expected loss of price per extra search is equal to the cost of extra search. In other words, the search will continue till the point, when marginal profit will equal to its minimum marginal profit.

Notes

Stigler believes that buyer will go to n number of shops and then buy with minimum priced shop. The expected profit by search n is the decreased function of search. The expected profit is zero if the search happens in long run. By the increasing cost of search, buyer will be in equilibrium on positive price which is zero. This is the point where the expected profit of search is equal to cost of search. **Stigler** says that the equalization the cost of search and the expected profit of search is a clarify theory, while a buyer buys a unique product like camera, piano etc. The economists are called this **Fixed Sample Sized Rule**.

To describe this theory, suppose that after n search, expected minimum price is E (P_n) and after n + 1 search, it is E (P_{n+1}). Suppose that buyer wants to buy a unit of product. The theory of **Stigler** hopes that buyer will buy from those shops where the expected loss of price is equal to the marginal cost of another search of a shop. Means,

$$E(P_n) - E(P_{n+1}) = C$$

Where C is marginal cost of an extra search, which is the time to go to shop and the cost of transport.

There is a cost in search till every shop he visits. When he finds a shop which is minimum priced shop then to go again on that shop, there is another cost of transport and if it is the last shop then it is called **Cost of Recall**. Buyer will give Cost of Recall if it is low from last informative price and the difference between minimum prices.

Self Assessment

Fill in the blanks:

1. In the view of time and transport, the cost of search is ..... .
2. Market has asymmetric ..... .
3. The cost of search is cost of ..... .

Its Criticism

The theory of **Stigler** has been criticized on following bases:

1. **Buyers does not know Distribution of Prices:** The assumption that buyer does not know distribution of prices, is not possible. Actually, the buyer does not know the price or distribution of prices or what happens in market until he goes to market.
2. **Knowledge of Cheap and Dear Shops:** This theory believes that a consumer does not know which shops sell a unique product on what price. Critics believe that it might be possible that a consumer does not know which shop sells high irrespective of price but he has knowledge of cheap and dear shops of market where he goes frequent to buy.
3. **No Explanation of Price Dispersion: Stigler** believes price dispersion as measurement of lack of knowledge. But it does not clarify that what is Price Dispersion and how does it related to lack of knowledge.
4. **Unrealistic Decision to Determine the Number of Searches:** The theory of **Stigler** believes that a buyer fixed his search before visiting to shops. It is unreal. It is possible that after visiting some shops, consumer gets new information which helps him to create a new plan of search.
5. **Decision Rule not Optimal:** According to **Rothschild**, the theory of **Stigler** that after equalizing the profit of an extra search and its cost, he fixed the number of shops which he wants to search is not optimal. He told that **Optimal Rule is Sequential**. It means that after knowing the price from every shop, consumer decides about his search that whether he will continue or stop.
6. **Decision Rule Ignores Information:** The critics vote that the decision theory of **Stigler** ignores the information of search. This information can change the decision of buyer. Suppose that there

Notes

is minimum price in first shop, the rule of **Stigler** believes that buyer will continue his search by remembering this value. This is unreal because if consumer gets a minimum price then there is no need to go further.

Rothschild's Model

Rothschild says that Stigler's decision rule is not optional because buyer is not utilizing the information gathered during the search of price to consider this fact. So buyer makes a **Sequential Search Model** and proposed the optimal rule that buyer decides to accept the price or to continue the search of price after gathering the information of the price. The buyer can identify the price of a shop, when he knows the distribution of price according to Stigler's conception. He thinks distribution price as observed minimum price P_R, which is reserved price for him. One more search has some profit E(G). The buyer will continue the search as long as G (profit) is greater than the cost of search (c). He will stop searching when he finds more cost than P_R. He accepts any price which is less than P_R or equal to P_R. But never accepts any price greater than P_R. In fact E (G) = C.

Rothschild's sequential rule is similar to **Stigler's** decision rule. It says that a consumer's search is based on the behaviour search of cost of price distribution. The search of as pecked cost increases. If the prices is more distributed, but the cost of search increases with the reducing the ratio of search. Buyer's search of behaviour is based on the **Stigler's** concept of distribution of price while **Rothschild** rejects the concept that a buyer has no information of distribution of price really. So he derived the O**ptimal Search Rule** by knowledge less distribution in his model.

Suppose that every search has a cost C and he wants to buy only one unit, while his income and preferences are given. He is ready to pay the maximum price which is P_M. To know this maximum price limit, he agrees, he can calculate all the average price of all shops which is P_M or less than P_M. When P_M is maximum price which buyer is ready to pay and starts searching by which he understands the reduction in fewer prices by P_M. The reduction feasibility in price in such a way, α (P_M) is equal to cost and less as exempted cost E (P_M) than P_M. So, the first search has following profit-

$$E(G) = \alpha (P_M) [P_M - E (P_M)]$$

If this searched profit is more than the cost of search E (G) > C, then first search is justified. If this is less E (G) < C, then the search is non-profitable. Suppose that buyer gets cost equal to P_M or more than that then this is first search. This is not justified that in the second search for as pecked profit match with the first search. Still if he gets the cost P_1 in first search that is less than the P_M then the profit is less in second search, i.e. $P_M - P_1$. So price rule says that expected profit of record search cannot more than expected profit of first search.

According to **Rothschild** this is the reservation price P_R which makes extra cost of expected profit for extra search. If buyer gets such a price which is equal to P_R or less than that then he will search no more, because the expected profit for extra searching on this price would be equal to extra price or less than this. So prior to start search, buyer fixed his P_R and rejected every price which is greater than P_R and ends his search when he gets P_R or less than P_R price.

According to **Rothschild**, the search costs of some buyers are more than others. So the behaviour of search is different from one buyer to others. For example, the search cost and reservation price are more for a rich man. While a poor buyer whose search cost and reservation prices are less, will go in lesser shops.

Self Assessment

Multiple choice questions:

4. After going to many shops the price which the buyer knows is ..... .
   (a) a hint (b) an expense (c) the cost (d) none of these

Notes

5. If the market is big then cost of search will ..... .
   (a) less (b) more (c) nothing (d) none of these
6. According to Stigler the price dispersion in the market is ..... .
   (a) Measurement of knowledge (b) Measurement of ignorance
   (c) Measurement (d) None of the these

Salop's Model

Salop forwards the sequential theory of **Rothschild** in his model. Because a buyer's searching practice is different from the other seller's use the search behave our of a customer is different from other. They take high price from the buyer who has high cost of search but they don't search the shop who keep less price. But the seller takes fewer prices that have less cost of search for the shop who keep less price. Such pricing policies increase the profit to seller if the market's buyer has high cost of search less price elastic because the rich buyer who searches less will stop searching on high price. The other side the poor buyer will continue the search till then they find the price is not less than the reservation price. Salop says this is **Stopping Rule**.

A seller uses the noise as a maximum control technique to repartee the high price paying buyer from low price paying buyer and to take less price from other buyers. **Salop** says such kinds of seller are 'the noisy monopolist' creating noise it can be measured the number of searches by the buyer such practices of price difference can be seen when the shops arrange random sale.

Salop starts with shopping role of sequential theory in which there is a optimal reservation price R is needed by which the buyer accept any price that is equal or less to R which does not search any more reservation price should be equal to cost of limited search. In other words, a change in reservation price decreases the expected purchasing lost and increases the same amount searching cost.

Reservation price, number of searches (creating noise) and total cost of purchasing depend on the cost of search per unit. The seller will take the price by which he gets maximum profit. Such prices depend on the total cost of purchasing of a buyer and concern relating. As the demand of product will increase with cost per unit search. If the unit cost of search is high the demanding cost will less plastic and there will be more high searching cost (rich) buyer then the low searching cost (poor) buyer. Then the seller will take high price from the rich buyer because the demand is less elastic for the product while he takes the less price from the poor buyer whose demand is in elastic.

Notes A consumer's searching practice depends upon the distribution searching price cost.

14.2 Asymmetric (or Imperfect) Information

Joseph Stieglitz, **Michal Spence** and **George Akerlof** were awarded Nobel Prize of economic in the year 2001 for their invention in the area of economic information. They challenged the concept of classic and neo-classic that the market is well informed and it takes an especial definitive stage. In same special situation, this concept makes very easy to the analysation, but it is unrealistic and not always true. To take examples from the real market conditions, they studied the incompleteness or defects due to incomplete information in market. Market is not capable to distribute their unlimited factors and handles them sufficiently. Below we learn the asymmetric information and their solutions.

Notes

The Theory of Asymmetric Information

Asymmetric information is such a condition, when a party has more information than the other about a durable product's nature, property and others therefore he influxes the result of a deal. It generates the moral hazards and adverse reflection which is as follows:

Advance Selection: The Lemons Problems

When a party has more information than the other then it creates problem of selection which appears as surprising result **Prof. Akerlof** has elaborated giving the result example of the market of old car in his famous book '*The market for lemons.*' There are two types of old cars. One is **cherries**, which are considered as good. The other is **lemons**, which are considered bad. Suppose a man purchases a new car. He is not satisfied by the performance and he wants to sell after a few months later, though this is good in condition when he tries to sell the car which is like a new then he will be offered a very low price by the carpeted customer. According to **Akerlof**, because the prospective customer has developed asymmetric information that car is not in order. So, the owner of the car is ready for selling it after buying few months ago. So, he has to sell the old car on the average market price, because in the market this is a lemon car for the prospective customer. But the car owner knows that his car is cherry which is like a new one. So, he refuses to sell the car because he is not getting the right price.

This way the owner of old good car (cherry) not sell their cars and only lemon car is being sold in the market. This is like the Gresham's law which says that "bad money keeps out good money from the market". Thus, it can be said that bad car keeps out good car from the old car market.

Now, we can describe this by an example. Suppose that prospect customer rate ₹ 60,000 for a bad car (lemon) and ₹ 1,20,000 for good car (cherry) in the market of old car. There is fifty-fifty chance of good or bad car for every car in the market. So the customer is ready to average of both type cars price I.C. ₹ 90,000 (= 120,000 + 60,000/2). The other ride, the car owner rates ₹ 1,00,000 for good car (cherry) and 50,000 for bad car (lemon). This situation creates the problem of **adverse selection**. There is adverse reflection situation because the seller has better knowledge than the buyers. It is different to distinguish the bad car before buying from the market for a customer.

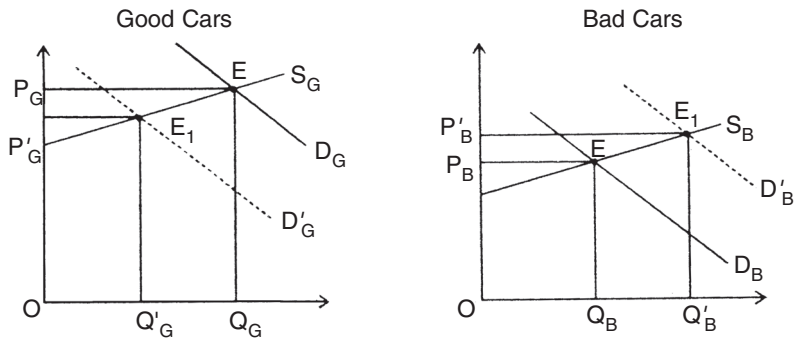
Suppose that the lemon price is between ₹ 60,000 and ₹ 90,000. Then the owner of good car will not sell the car because their car price is ₹ 1,00,000. Because the bad car seller is getting better price which is more than the ₹ 50,000. They will present to sell their car Resulting, There is no sell for good car. Finally, the customer feels that the probability of bad car is more. Therefore, in the market of old car price is ₹ 60,000 reduced and only bad car will be selling for good car. This is the case of separating equilibrium which reporter the good cars and bad cars market.

Figure 14.1 describes the problem of the lemon and solution. In figure's Panel A exhibits the good car when S_G is curve of supply and D_G is curve of demand. Thus, Panel B exhibits S_B as the supply curve of bad cars and D_B of its demand curve.

Suppose the old car market is complete informed when the buyer and seller know the quality of cars which they want to buy and sell. In panel A, the number of good cars is OQ_G sells on higher price of OP_G and in panel B, the bad cars OQ_B sells on price OP_B. The customer has no information about the quality of cars due to adverse reduction from asymmetric information, so the sellers of good cars purposed the price $OP_{G'}$ resulting the demand of good cars fall downs by OP'_G as the D_G curve of demand and S_G supply of curve in show the corresponding point E_1. figure B exhibits situation of the price OP'_B in increase in demand OQ'_B in adverse relation. This price is ready to pay by both buyer and seller. Finally, in the old car market, only bad cars are sold on this price.

Notes

Fig. 14.1



Pooling and Guarantees

The above analysis is called **Pooling Equilibrium** because good cars and bad cars are conjugated in the market. Which results the owner of good cars is in loss because they can't sell their cars. To solve this problem, sellers guarantee the customer in situation of any problem in car. Only the bad cars owner gives guarantee. Suppose that an average cost of repairing is ₹ 5000 for a bad car. So the customer would pay at the time of purchasing the car 60,000 – 55,000 for each car. But if the average cost of repairing is ₹ 10,000 then the customers will pay only ₹ 60,000 – ₹ 10,000 = ₹ 50,000. But the bad cars are not being sold on this price. As per concern of good cars, the customers know that the seller will take high price and the quartered is not needed. Still the seller good cars give the warranty to their customer. A warranty is the writer assurance for the customer that during their particular period if any problem found in the repairing cost will paid their particular period if any problem found in the car, the repairing cost will paid by the seller. So the buyer is ready to give high price for the good cars. This is the condition of Separating Equilibrium which differentiate the market of bad and good cars.

Did u know? A poor buyer who has less cost searching and less reservation price will go less number to shops.

Moral Hazard

In fact, very few good cars owner want to give extended warranty at the time of selling. It has two reasons: **First**, the problem of moral hazard. When the buyer wants the cost of car with own responsibility, then moral lizard felt. When a seller sells the car with a warranty, then the new owner drives the car without caring (Responsibility), because he knows that the all repairing costs have to be paid by the seller. That is why any seller does not want to give any type of warranty to the customer.

Second, the problems to implement the warranty. After taking warranty the seller is not easily available to customer and the customer can't pay bills for repairing. The seller can refuse the claim for money on the argument of negligence in case of the car.

Notes

This way, the moral hazard and the implementation of warranty, prevent the pooling equilibrium of good and bad cars. This is the reason they are conjugated together in the market.

Market Signalling

To solve the problem of adverse selection and moral hazard, **Michael Spence,** a famous Nobel Economist, has suggested the Market Signalling. He showed when information is asymmetric; signalling creates the information about features of men in job market. The concept is that the applicants are signalling all information about their qualifications for a particular employment to the employer. According to Spence, a signal is given by education and the employer considers a test of original qualification of degree. They mean more productive and pay high salary for the applicants who have high level of education. The other side, they mean less productive and pay salary for the applicants who have low level of education. This way the education is signal of productivity.

To describe the signalling, **Spence** developed a model of market-employment. Which is based on the education of the applicant.

Self Assessment

State whether the following statements are True/False:

7. A little change in reservation price can reduce the expected purchasing cost.
8. The reservation price, number of searches and that cost of purchasing depend on the searching cost per unit.
9. When one party has more information than the other, then it creats the problem of favourable selection.
10. Economist and economic analyst have studied the practice of price in the stock market.

Assumptions

This model is based on the following facts:

1. The level of education and productivity is positively co-related.
2. The college and institution can lost more cheaply the productivity than the employer.
3. High qualified is mean that low cost of education.

The Model

Having such perceptions, suppose that an employer finds groups of people searching the job in the competitive labour market. **Group-1** labour has low productivity. Their maximum production is 1. They don't have college degree. And **Group-II**, has degree, their maximum production is 2; because there is difference in the level of education.

Spence measures the level of education and a composite index of year which is shown as Y. A man has the cost of education Y in group-I and Y/2 in group-II. It means that cost of education having low productivity has more than the cost of education having high productivity. Suppose, $C_1 = y$ is the cost of education for group-1 and $C_2 = y/2$ is the cost of education for group-II. If C_1Y is ₹ 60,000 then C_2 = Y/2 ₹ 30,000. Now, suppose that the employer decides the expected productivity ₹ 50,000 by giving the employment for their life time of the group and ₹ 1,00,000 for the men of group-II productivity. Identifying the both types of people for the job, the employer proposed the wage schedule. w (y) of w_1 d = ₹ 50,000 for group-I and w_2 ₹ 1,00,000 for group-II for their life time.

Notes

The level of education is just a process of a sharpening or signalling which is implemented in the proposal employment of the people of both groups by an employer. In fact, the level of education is implemental as the indication to measure the productivity of the worker of the both groups.

According to **Spence**, the balance is in the form of available market data. The signalling balance is described as follows on the basis of above mentioned market data.

Suppose that the employer decides that the men having below $\bar{Y}$ level of education is related to group-I and the men having $\bar{Y}$ and above level of education is related to group-II. The level of education $\bar{Y}$ is the benchmark by the employer.

For the cost of education ($c = \bar{y}$) and wage schedule ω ($\bar{y}$) is given, for jobseeker man, the education is favourable selection, the value y is level of education on which the proposed wage and the cost of education is in maximum difference.

To decide this that should receive the degree of college, the job seeker compares the cost of education and its return (or profit). The cost of taking degree is ₹ 50,000 = (₹ 100,000 – ₹ 50,000). The deference of proposed wage of two groups by the employer is ($w_2 - w_1$ = ₹ 100,000 – ₹ 50,000. The cost of education is $C_1 = y$ = ₹ 60,000 for group-I and $C_2 = y/2$ = ₹ 30,000 for group-II.

In group-II, the return of education is higher than the cost of education ₹ 50,000 > ₹ 30,000. So, In this group, the all job seekers will get the horizontal level $\bar{Y}$ until $\bar{Y} < 1.6$.

In group-I, the cost of education is higher than the return ₹ 60,000 > ₹ 50,000,. In this group all Job seekers will get the level $\bar{Y}$ until $\bar{Y} > 0.8$.

This will lead towards equilibrium (balance) until 0.8 and 1.6 is the mean.

Suppose that a employer decides the level of education $\bar{Y}$ 1.2 for recruitment because the level of education $\bar{Y}$ (= 0.8) is less group – I job seeker and they are not degree holder, the employer proposel the ₹ 50,000 as wage to this low productivity group. In the group-I, the maximum option is not to take education, y = 0 or to take proper education $\bar{Y}$, They can't select $\bar{Y}$ because the cost of education is more (₹ 60,000) than their increase in income (₹ 50,000) if they take degree. So, they will not take any degree. In group-II, the job seeker will get the level of education $\bar{y}$ = 1.2 because their increase in income is more than the cost of education (₹ 30,000).

So, the equilibrium (balance) is established in the employment market. When man select the each zero level of education ($\bar{y}$ = 0) in the group-I and in group-II select the level of education $\bar{y}$, the level of education is the indication of the productivity of the men of the both groups.

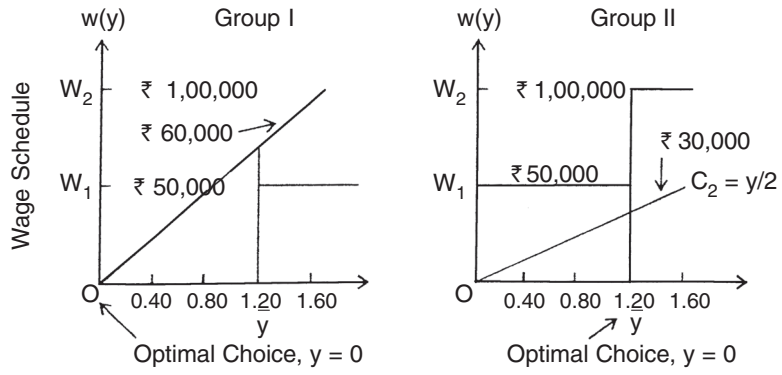
In fig. 30.2 (A) and (B) describe the signalling of the both groups in sequence. The proposed wage scheduled is measured on the vertical axis ω_1= ₹ 50,000 and ω_2 = ₹ 1,00,000. The horizontal axis shows the level of education Y. $C_1 = y_1$, the cost of education is curve for group-I and C_2 = y, the cost of education is curve for group-II. It C_1 and C_2 is given wage schedule for group-I $\bar{Y}$ = 1.2 encourage the satisfaction on being in low level of educated because the $C_1 > w_1$. So, the selection of maximum degree is not to receive, which mean, $\bar{y}$ = 0 which shows in fig. panel (A) for then, In panel (B) for group-II the selection of maximum degree shows that the level of education $\bar{y}$ = 1.2 received and their wage is proposed ₹ 1,00,000 instead of w_1= ₹ 50,000.

14.3 The Efficient Market Hypothesis

Economist and financial analyst have studied the behaviour of price in the market. It has developed the fanatic theory of stock market, which has been grouped under the efficient market hypothesis (EMH).

Notes

Fig. 14.2



Task Give your opinion on Asymmetric Information.

Meaning

The concept of efficient market shows this is the stock share and security price which collect very fast according to new information and reflect the complete available information of present price.

EMH is also known as efficient market by information, the decelerating of company in capital market, reports, financial summary and for political statements, international incidents like war, crisis etc, enters regularly, Such all information reflects in the current share pricing, For Example; in the last month of year 2002, the Reliance Company discovered the oil is cartel area of Andhra. This information intently reflected in the share price which was increased that day. Similarly, the doubt of gulf war has always increased the share price of old companies across the world because the possibility of oil stock shortage.

Its Assumptions

EMH is based on following assumptions:

1. There are many particulars in the market. They evaluate and analyse the free stock to each other.
2. The update information comes suddenly in the capital market of stock and every information is independent to the information.
3. The participants (buyer and seller) very fast update information of the stock price.
4. Current stock price reflects the instant available information.
5. The expected returns in current price stop the risk.

Notes

14.4 Summary

- The optimal search depends on the expected profit by search of buyer. Expected profit is expected loss in price. Generally, if buyer spends a big part of his income on a particular object, then his expected profit is more than the search. He will spend more time in search.

14.5 Keywords

- **Probability:** Possibility
- **Buyer:** Person who buys
- **Asymmetric:** Asymmetric

14.6 Review Questions

1. What is the purpose of theory of search? Explain it.
2. Write a comment on "Salop Model".
3. What do you mean by asymmetric information?
4. What is market signalling? Explain.

Answers: Self Assessment

1. Constant	2. Information	3. Time	4. (a)
5. (b)	6. (b)	7. True	8. True
9. False	10. True		

14.7 Further Readings

Books

1. **Microeconomics** — *Frank Cowbell, Oxford University Press, 2007.*
2. **Microeconomics** — *Robert S. Predik, Daniel L. Rubenfield and Prem L. Mehta, Pearson Education, 2009, PBK, 7th Edition.*
3. **Microeconomics** — *David Bosanko and Ronald Brutigame, Wiley India, 2011, PBK, 4th Edition.*