Manonmaniam Sundaranar University

Directorate of Distance and Continuing Education
Tirunelveli – 627012, Tamil Nadu.

M.A.ECONOMICS
(First Year)
Advanced Micro Economics
(SECM11)

Prepared by

Dr. K. AJITHA
Assistant Professor of Economics
Manonmaniam Sundaranar University
Tirunelveli – 627 012.

Subject Experts:

Dr. D. Amutha Associate Professor and Head Department of Economics S.T. Mary's College (Autonomous) Thoothukudi	**Dr. C. A. Sham Shankar** Associate Professor and Head Department of Economics ST. Hindu College Nagercoil
Dr. S. Sarasudevi Associate Professor Department of Economics Rani Anna Government College for Women Tirunelveli	**Dr. V. Raja Rajeswari** Associate Professor Department of Economics Sri KGS Arts College Srivaikundam, Thoothukudi District
Dr. M. Neeladevi Associate Professor Department of Economics V.O.C College Thoothukudi	**Dr. P. Mary Thangam** Assistant Professor Department of Economics Sarah Turker College (Autonomous) Tirunelveli
Dr. R. Rajan Babu Assistant Professor Department of Economics ST. Hindu College Nagercoil	**Dr. V. Arockia Amuthan** Assistant Professor Department of Economics Nazareth Margoschis College Pillaiyanmanai, Thoothukudi
Dr. S. Sasikumar Assistant Professor Department of Economics ST. Xavier's College (Autonomous) Palayamkottai, Tirunelveli	**Dr. G. Gnana Elpinston** Assistant Professor Department of Economics Nesamony Memorial Christian College Marthandam

Course Coordinator:

Dr. G. Monikanda Prasad
Assistant Professor of Economics
Manonmaniam Sundaranar University
Tirunelveli – 627 012

Course Material Compiled by:
Dr. K. Ajitha
Assistant Professor of Economics
Manonmaniam Sundaranar University
Tirunelveli – 627 012

SEMESTER – I

ADVANCED MICRO ECONOMICS

Course Objectives:

1) To make the students to understand co
2) Consumer behavior with the theories of Demand and Production.
3) To elaborate various market structure and the theories of distribution.

UNIT I: CONSUMER CHOICE

Cardinal and ordinal utility - Indifference curve approach – Slutsky's Decomposition of price effect into substitution effect and income effect – Consumer surplus - Marshall's and Hicksian measures – Compensatory Demand Curve- Revealed Preference Theorem- and derivation of Marginal Utility schedule for money income.

UNIT II: ECONOMICS OF INFORMATION

Informational asymmetry –- Choice under Uncertainty - N-M Index – Inter-temporal choice -Market for lemons- Adverse selection – Insurance market and adverse selection – Solution to principal agent problem- Hidden action (Moral Hazard) - Signalling and Screening.

UNIT III: MARKET STRUCTURE MODELS

a) Perfect competition – Price and output determination – Optimum firm
b) Monopoly – Short run and long run equilibrium - Price discrimination monopoly control, and regulation – Contestable Market
c) Monopolistic competition–Chamberlin Model- selling costs - Excess capacity
d) Oligopoly – Duopoly price game-dominant strategy-Nash Equilibrium Non-collusive Models - Cournot- Bertrand – Chamberlin – Edgeworth – Sweezy – Stackelberg- Oligopoly - Collusive Models - Cartels and mergers -Price leadership - Base point price system
e) Monopsony – Price and output determination – Workable competition.

UNIT -IV: ALTERNATIVE THEORIES OF FIRM

Full Cost Pricing Rule- Limits pricing theory- Bains Theory- Sylos-Labini Model-Modigliani's Models- Input-output model -Linear programming

applications in decision making- Peak Load Pricing – Administered Pricing- Purchasing Power Parity Price.

UNIT -V: DISTRIBUTION THEORIES

Neo-classical approach – Marginal productivity theory; Product exhaustion theorem; - Modern theory of distribution – Factor Pricing in imperfect product and factor markets- Determination of Wages –Labour supply and wage determination – Role of trade unions and collective bargaining- Theories of Interest- Theories of Profit.

Text Books:

1) Jhingan M.L, (2004 Reprint) Advanced Economic Theory (Vrindha Publications (P) Ltd., New Delhi.
2) Agarwal, H.S. Micro Economic Theory, (Ane's Books Pvt. Ltd.,) New Delhi.

References:

1. Hal R. Varian (2004), Intermediate Micro Economics (East-West Press: New Delhi).
2. Ruffin Roy. J (1992), Intermediate Micro Economics Harper & Collins Publishers.
3. Koutsyiannis A. (1978), Modern Micro Economics, (Macmillan-London).

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UNIT – I

CONSUMER CHOICE

1.1. INTRODUCTION

Any individual engaged in consumption process is a consumer. An understanding of the consumer's behavior helps us to understand the reasons why a typical consumer behaves in a certain manner. This is done with the help of modern economics. The study of consumer behaviour describes the decision making or the choice process of a consumer. It systematically studies individuals' economic behaviour and phenomena when faced with a set of choices and some constraints. Consumer theory aims to model economic behaviour/activities of individuals pursuing his/her own private interests. A major step for studying an economic issue is to make assumptions about individual's behaviour. A key assumption about an individual's behavior is that an individual is self-interested. A consumer can be characterized by many factors and aspects such as tastes, income, wealth, age, lifestyle, ability, intelligence, etc. But which are most important ones for us to study consumer's behavior in making choices? A basic question which arises is: how does a consumer choose a good to be consumed? The theory is very simple: Economists assume that consumers choose the best bundle of goods they can afford. We will focus on basic concepts related to factors affecting consumers' preferences. We will describe consumers' preferences and behaviour and study how it gets converted into demand. This will be well explained with the help of fundamental concept of individual demand. It will be followed by the concept of market demand, factors affecting demand and from these, we will derive the law of demand.

1.1.1. Theory of Consumer Behavior

The theory of consumer behavior describes how consumers buy different goods and services. Furthermore, consumer behavior also explains how a consumer allocates its income in relation to the purchase of different commodities and how price affects his or her decision. One of the theories used to explain consumer behavior is utility theory.

The Utility Theory

The utility theory aims to explain the situation of consumer behavior in regard to the satisfaction that a consumer gets from the consumption of a commodity. Utility theory was developed and introduced in 1870 by a British Economist, William Stanley Jevons. The term utility refer to the satisfaction or benefit that a consumer derives consumption of the commodity. The utility can be measured in utils.

Utility Analysis

Utility analysis, attempts to explain consumer behavior, on the basis of satisfaction derived from the consumption of commodities. Of course, the utility derived from the consumption affects the consumer's purchase and consumption decision. The concept of utility can be explained with the help of various examples:

1. A person who is on fasting for two days when offered food will get utility (satisfaction)
2. A kid when crying is offered toys to play also gets satisfaction. Thus, both examples referred above offers satisfaction owing to the satisfaction of needs and wants.

1.1.2. Types of Utility

There are two types of utility:

1. **Total Utility**
2. **Marginal Utility**

Total Utility:

The term total utility means the total satisfaction derived from the consumption of commodities.

Marginal Utility:

Marginal utility be defined as the additional utility derived from the consumption of an additional unit of a commodity. Therefore, we can say that Marginal utility is the extra satisfaction gained from a one more additional unit of that particular commodity. Marginal utility may be calculated as follows:

Marginal Utility = change in Total Utility / change in quantity consumed

Cardinal Utility Analysis

Cardinal utility analysis is based on the cardinal measurement of utility which assumes that utility is measurable and additive. This theory was developed by neo-classical economists like Marshall, Pigou, and Robertson etc. It is expressed as a quantity measured in hypothetical units which called utils. If a consumer imagines that one mango has 8 utils and an apple 4 utils, it implies that the utility of mango is twice than of an apple.

Assumptions of Cardinal Utility Analysis:

1. Rational consumer Cardinal utility analysis assumes that consumer is rational. He makes every effort to maximize his total utility under the income and price constraint. While going for the purchase or consumption of good, a consumer will act rationally to maximize his level satisfaction.

2. Cardinal measurement of Utility the utility of each commodity is measurable and quantifiable i.e. Utility is cardinal concept. The most convenient measure is money. Thus utility can be measured quantitatively in monetary units or cardinal units. Therefore whenever a person consumes any commodity, he can express or measure his satisfaction in cardinal term. For example, a person having a glass of milk can say that he got 10 utils from it. Moreover cardinal measurement of utility enables the comparison of utilities derived from two different goods. For example, a person can say that the utility he gets from the consumption of milk is twice the utility he gets from the consumption of Juice.

3. Constant Marginal Utility of Money the utility derived from commodities are measured in terms of money. According to Marshall, money is the measuring rod of money. So, money is a unit of measurement in cardinal approach. Marshall argues that that the amount of money which a person is prepared to pay for a unit of a good rather than go without it is a measure of utility he derives from that good. According to him measurement of marginal utility of good in terms of money is only possible if the marginal utility of money itself remains constant. Hence, marginal utility of money should be constant.

4. Diminishing Marginal Utility if the stock of commodities increases with the consumer, each additional stock or unit of the commodity gives him lesser and lesser satisfaction. Every additional intake of good will yield less utility

as compared to the utility obtained from the previous unit of the good. It means utility increases at a decreasing rate.

5. Independent Utilities It means utility obtained from one commodity is not dependent on utility obtained from another commodity. In other words, it means that the utility which a consumer derives from the consumption of that commodity is the function of the quantity of only that good. It is not affected by the consumption of other commodities.

Approaches to Cardinal Utility Analysis the two approaches of Cardinal utility analysis are as follows:

a) Law of Diminishing Marginal Utility
b) Law of Equi-Marginal Utility

1.1.3. LAW OF DIMINISHING MARGINAL UTILITY

According to the Law of Diminishing Marginal Utility, marginal utility of a good diminishes as an individual consumes more units of a good. In other words, as a consumer takes more units of a good, the extra utility or satisfaction that he derives from an extra unit of the good goes on falling. It should be carefully noted that is the marginal utility and not the total utility than declines with the increase in the consumption of a good. The law of diminishing marginal utility means that the total utility increases but at a decreasing rate.

"The additional benefit which a person derives from a given increase of his stock of a thing diminishes with every increase in the stock that he already has." This law is based upon two important facts. Firstly, while the total wants of a man are virtually unlimited, each single want is satiable. Therefore, as an individual consumes more and more units of goods, intensity of his want for the goods goes on falling and a point is reached where the individual no longer wants any more units of the goods. That is, when saturation point is reached, marginal utility of goods becomes zero. Zero marginal utility of goods implies that the individual has all that he wants of the goods in question.

The second fact on which the law of diminishing marginal utility is based is that the different goods are not perfect substitutes for each other in the satisfaction of various particular wants. When an individual consumes more and more units of a goods, the intensity of particular want for the goods

diminishes but if the units of that goods could be devoted to the satisfaction of other wants and yield as much satisfaction as they did initially in the satisfaction of the first want, marginal utility of the good would not have diminished. It is obvious from the above that the law of diminishing marginal utility describes a familiar and fundamental tendency of human nature. This law has been arrived at by introspection and by observing how people behave.

Table 1.1. Diminishing Marginal Utility

Cups of Tea	**Total Utility**	**Marginal utility**
Consumed per day	(units)	(units)
1	12	12
2	22	10
3	30	8
4	36	6
5	40	4
6	41	1
7	39	-2
8	34	-5

Consider Table 1.1 in which we have presented the total and marginal utilities derived by a person from cups of tea consumed per day. When one cup of tea is taken per day, the total utility derived by the person is 12 units. And because this is the first cup its marginal utility is also 12. With the consumption of 2nd cup per day, the total utility rises to 22 but marginal utility falls to 10. It will be seen from the table that as the consumption of tea increases to six cups per day, marginal utility from the additional cups goes on diminishing (i.e., the total utility goes on increasing at a diminishing rate).

However, when the cups of tea consumed per day increase to seven, then instead of giving positive marginal utility, the seventh cup gives negative marginal utility equal to -2. This is because too many cups of tea consumed per day (say more than six for a particular individual) may cause him acidity and gas trouble. Thus, the extra cups of tea beyond six to the individual in question give him disutility rather than positive satisfaction. We have graphically represented the data of the above table in Figure 1.2 we have constructed rectangles representing the total utility obtained from various

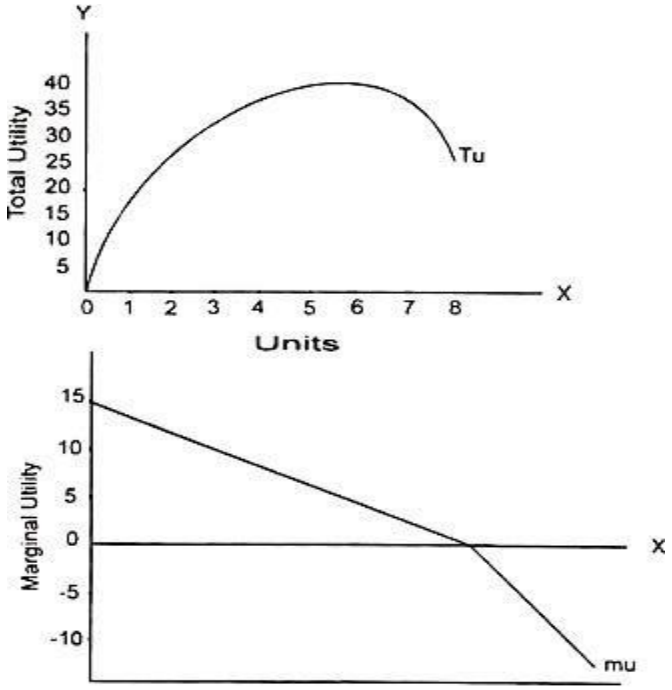


Fig.1.2. Diminishing Marginal Utility

numbers of cups of tea consumed per day. As will be seen in the Figure, the length of the rectangle goes on increasing up to the sixth cup of tea and beyond that length of the rectangle declines, indicating thereby that up to the sixth cup of tea total utility obtained from the increasing cups of tea goes on increasing whereas beyond the 6th cup, total utility declines. In other words, marginal utility of the additional cups up to the 6th cup is positive, whereas beyond the sixth cup marginal utility is negative. The marginal utility obtained by the consumer from additional cups of tea as he increases the consumption of tea has been shaded. A glance at the Figure 1.2 will show that this shaded area goes on declining which shows that marginal utility from the additional cups of tea is diminishing. We have joined the various rectangles by a smooth

curve which is the curve of total utility which rises Up to a point and then declines due to negative marginal utility.

Moreover, the shaded areas of the rectangles representing marginal utility of the various cups of tea have also been shown separately in the figure given below. We have joined the shaded rectangles by a smooth curve which is the curve of marginal utility. As will be seen, this marginal utility curve goes on declining throughout and even falls below the x-axis. Portion below the x-axis indicates the negative marginal utility. This downward-sloping marginal utility curve has an important implication for consumer's behavior regarding demand for goods. We shall explain how the demand curve is derived from marginal utility curve. The main reason why the demand curves for good slope downward is the fact of diminishing marginal utility. The significance of the diminishing marginal utility of a good for the theory of demand is that the quantity demanded of a good rises as the price falls and vice versa. Thus, it is because of the diminishing marginal utility that the demand curve slopes downward.

1.1.4 LAW OF EQUI-MARGINAL UTILITY

The Equi-marginal principle is based on the law of diminishing marginal utility. The equi-marginal principle states that a consumer will be maximizing his total utility when he allocates his fixed money income in such a way that the utility derived from the last unit of money spent on each good is equal. Suppose a man purchases two goods X and Y whose prices are P_X and P_Y, respectively. As he purchases more of X, his MU_X declines while MU_Y rises. Only at the margin the last unit of money spent on X has the same utility as the last unit of money spent on Y and the person thereby maximizes his satisfaction. Only when this is true, the consumer will not be distributing his money in buying good X and Y, since by reallocating his expenditure he cannot increase his total utility.

This condition for a consumer to maximize utility is usually written in the following form:

$$MU_X/P_X = MU_Y/P_Y$$

So long as MU_Y/P_Y is higher than MU_X/P_X, the consumer will go on substituting Y for X until the marginal utilities of both X and Y are equalized. The marginal utility per rupee spent is the marginal utility obtained from the last unit of good consumed divided by the price of good (i.e., MU_X/P_X or MU_Y/P_Y). A consumer thus gets maximum utility from his limited income when the marginal utility per rupee spent is equal for all goods.

Example:

This equi-marginal principle or the law of substitution can be explained in terms of an arithmetical example. In Table 1.2, we have shown marginal utility schedule of X and Y from the different units consumed. Let us also assume that prices of X and Y are Rs. 4 and Rs. 5, respectively. MU_X and MU_Y schedules show diminishing marginal utilities for both goods X and Y from the different units consumed. Dividing MU_X and MU_Y by their respective prices we obtain weighted marginal utility or marginal utility of money expenditure. This has been shown in Table 1.3.

Table 1.2. Marginal Utility Schedules

Number of units consumed	MU_X	MU_Y
1	40	55
2	36	50
3	32	30
4	28	20
5	24	15
6	20	5

Table.1.3. MU_X/P_X and MU_Y/P_Y schedules

Number of units consumed	MU_X / P_X	MU_Y / P_Y
1	10	11
2	9	10
3	8	6
4	7	4
5	6	3
6	5	1

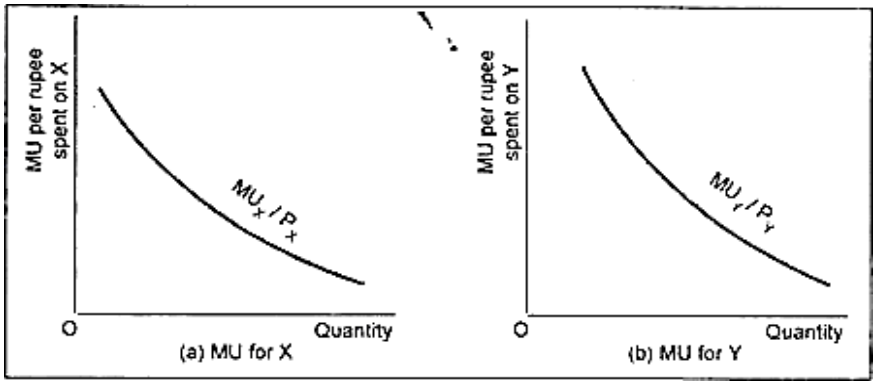
MU_X/P_X and MU_Y/P_Y are equal to 6 when 5 units of X and 3 units of Y are purchased. By purchasing these combinations of X and Y, the consumer spends his entire money income of Rs. 35 (= Rs. 4 x 5 + Rs. 5 x 3) and, thus, gets maximum satisfaction [10 + 9 + 8 + 7 + 6] + [11 + 10 + 6] = 67 units.

Purchase of any other combination other than this involves lower volume of satisfaction.

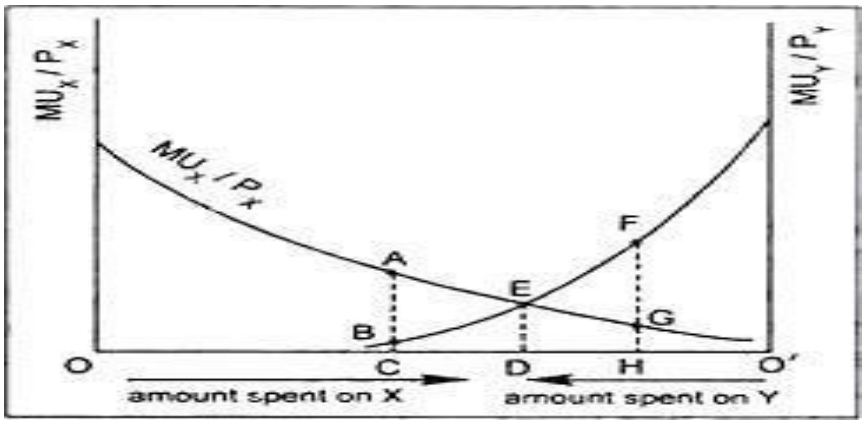
Graphical Representation:

The above principle can also be illustrated in terms of a figure. We have drawn marginal utility curves for goods X and Y in Fig 1.3(a) and (b). Here we use marginal utility and price. Marginal utility per rupee spent on good X = MU_X/P_X, and that of Y = MU_Y/P_Y. The MU_X/P_X curve has been shown in Fig. 1.3(a) while the MU_Y/P_Y curve has been shown in Fig. 1.3(b). We have not drawn negative portion of the marginal utility curves. Now, by superimposing Fig. 1.3(b) on Fig. 1.3(a), we get Fig. 1.3 in which we measure available income—00'—of the consumer on the horizontal axis.

Fig. 1.3. Equi – marginal principle



Our consumer maximizes his total utility by spending OD amount on good X and O'D amount on good Y. By purchasing this combination, the consumer equalizes marginal utilities per rupee spent on X and Y at point E (i.e., $MU_X/P_X = MU_Y/P_Y$ = ED). No other combination will give greater satisfaction.



If our consumer spends OC on good X and O'C on good Y then MU_X/P_X will exceed MU_Y/P_Y by the distance AB. This will induce the consumer to buy

more of X and less of Y. As a result, MU_X/P_X will fall, while MU_Y/P_Y will rise until equality is restored at point E. Similarly, if the consumer spends OH on X and O'H on Y then $MU_X/P_X < MU_Y/P_Y$. Now, the consumer will buy more of Y and less of X. This substitution between X and Y will continue until $MU_X/P_X = MU_Y/P_Y$. Therefore, the consumer can derive maximum satisfaction only when marginal utility per rupee spent on good X is the same as the marginal utility per rupee spent on another good Y. When this condition is met, the consumer does not find any interest in changing his expenditure pattern.

The equilibrium condition can now be rewritten as:

$MU_X/P_X = MU_Y/P_Y$

This equation can, however, be rearranged in the following form**:**

$MU_X/MU_Y = P_X/P_Y$

This equation states that a consumer reaches equilibrium when he equalizes the ratio of marginal utilities of both goods with the price ratio.

However, this equilibrium condition can be extended to **'n'** number of commodities.

For 'n' number of commodities, the equilibrium condition is:

$MU_A/P_A = MU_B/P_B = MU_C/P_C = \ldots\ldots = MU_n/P_n$

Limitations:

Firstly, the law of equi-marginal utility is based on the measurability of utility in cardinal numbers. But utility is a subjective concept and, hence, not quantifiable.

Secondly, this law assumes that the consumer acts rationally. No consumer, in fact, purchases commodity in accordance with this principle of substitution. In fact, purchases are often guided by habit, sentiment, prejudice, or custom.

Thirdly, this law cannot be applied in the case of indivisible commodities like motor car, refrigerator, etc. Since these commodities are not divisible into smaller units, the law may seem to be inoperative.

Derivation of Demand Curve from Equi-Marginal Utility:

In order to be able to derive the demand curve for a commodity we must know the equilibrium purchase plan of a consumer of various commodities.

We want to know the equilibrium purchase of commodities because the basic aim of a consumer is the maximization of satisfaction from the consumption of various commodities. The equilibrium of the consumer may be explained in terms of the law of equi-marginal utility or the law of substitution. This law states that a consumer will be maximizing his satisfaction from the expenditure of his limited money income when the marginal utility per rupee spent on, say, one good, X, is the same as the marginal utility of rupee spent on another good, Y. In other words, a consumer reaches equilibrium when the marginal utility per rupee of good X (MU_X/P_X) is equal to the marginal utility per rupee of good Y (MU_Y/P_Y).

Ordinal Utility Theory:

Ordinal utility approach is a school of thought that believes that utility cannot be measured quantitatively, that is, utility is not additive rather it could only be ranked according to preference. The consumer must be able to determine the order of preference when faced with different bundles of goods by ranking the various 'baskets of goods' according to the satisfaction that each bundle gives. For instance, if a consumer derives 3 utils from the consumption of one unit of commodity X and 12 utils from the consumption of commodity Y, this means that the consumer derives more satisfaction from consuming commodity Y than from commodity X. Though to the cardinals, the consumer derives four times more utility from one unit of Y than from X. The ordinal utility theory explains consumer behaviour by the use of indifference curve.

Assumptions of Ordinal Utility Approach

(i) Rationality: - The consumer is assumed to be rational meaning that he aims at maximizing total utility given his limited income and the prices of goods and services.

(ii) Utility is Ordinal: - According to this assumption, utility is assumed not to be measurable but can only be ranked according to the order of preference for different kinds of goods.

(iii) Transitivity and Consistency of Choice: - By transitivity of choice, it means that if a consumer prefers bundle A to B and bundle B to C, then invariably, the consumer must prefer bundle A to C. Symbolically, it is written

as: If A > B and B > C; then A > C. By consistency of choice, it is assumed that the consumer is consistent in his choice making. If two bundles A and B are available to the consumer, if the consumer prefers bundle A to B in one period, he cannot choose bundle B over A nor treat them as equal. Symbolically: If A > B, then B > A and A ≠ B

(iv) Diminishing Marginal Rate of Substitution (MRS):- MRS is the rate at which the consumer can exchange between two goods and still be at the same level of satisfaction. This assumption is based on the fact that the preferences are ranked in terms of indifference curves which are assumed to be convex to the origin.

(v) **The Total Utility of the** consumer depends on the quantities of the commodities consumed. That is, the total utility is the addition of the different utilities. u = f (q1, q2 ---------qn)

(vi) Non Satiation: - it is assumed that the consumer would always prefer a larger bundle of goods to a smaller bundle of the same good. He is never over supplied with goods within the normal range of consumption.

1.2 INDIFFERENCE CURVE ANALYSIS

Situations can arise when a consumer consumes a large number of goods, the consumer may substitute one commodity for another and still be on the same level of satisfaction. As the consumer increases the consumption of one of the commodities, he must reduce the consumption of the second commodity and vice versa, to maintain the same level of satisfaction. When plotted graphically, it gives rise to what is known as an indifference curve. An indifference curve is defined as the locus of points representing different combination of two goods which yield equal utility to the consumer so that the consumer is indifferent to the combination consumed. When the preferences are plot graphically, it gives an indifference curve (Figure 1.4a). An indifference curve is also called iso-utility curve or equal utility curve. It is assumed that the goods may not be perfect substitutes but if the commodities are perfect substitutes, the indifference curve becomes a straight line with a negative slope (Figure 1.4b). And if the commodities are complements the curve assumes the shape of a right angle (Figure 1.4c).

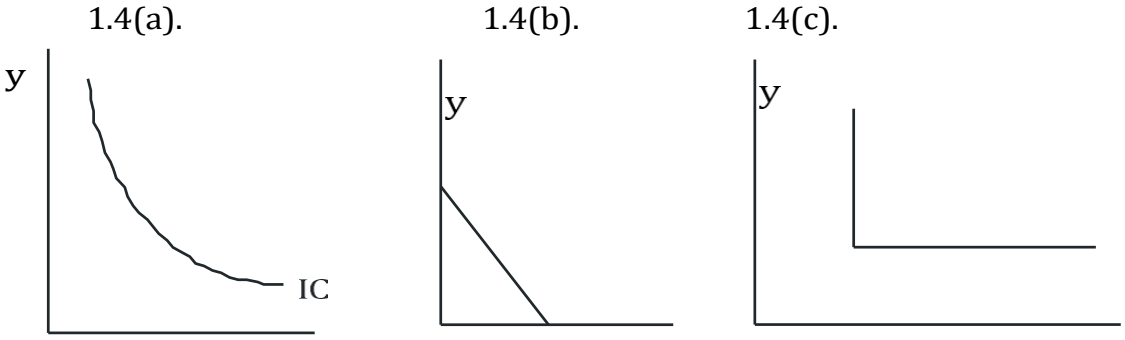


Figure 1.1: Different shapes of Indifference Curve

Table 1.3: A Hypothetical Indifference Schedule

Combination	Units of commodity x	Units of commodity y	Utility
a	3	28	u
b	6	23	u
c	10	16	u
d	18	12	u
e	26	8	u
f	30	5	u

When the combinations a, b, c, d, e, f are plotted on a graph, the resulting curve is known as indifference curve. The indifference curve slopes downward from left to right showing that it is convex to the origin. Different sets of indifference curves give an indifference map. An indifference map (Figure 1.2b) contains different number of indifference curves to show that the consumer may also choose other combinations of goods X and Y. The combinations of goods on a higher indifference curve yield higher level of satisfaction and are preferred. From Figure 1.2b, combination of goods X and Y on IC_3 is higher than the combination on IC_2, while the combination on IC_2 is higher than the combination on IC_1.

Properties of an Indifference Curve

1. Indifference curves are negatively sloped: - This negative slope shows that for a consumer to stay on the same level of satisfaction, as the consumption of one commodity (X) increases, the quantity of the other commodity (Y) must decrease. This reflects the marginal rate of substitution. Marginal rate of substitution describes the rate of exchange between two

commodities. For our two commodities X and Y, the marginal rate of substitution of commodity X for commodity Y denoted as MRSx,y is the rate at which commodity X can be substituted for commodity Y, leaving the consumer at the same level of satisfaction. It is also known as the negative slope of an indifference curve at any one point.

2. Indifference curves must not Intersect: - If two indifferent curves intersect, it means two different levels of satisfaction at the point of intersection. This situation is impossible because it implies inconsistency in consumer's choices. In other words, it nullifies the consistency and transitivity of choice assumption.

3. Upper indifference curve indicates a higher level of satisfaction: - An upper indifference curve contains a larger combination of both commodities than a lower one and gives the consumer a higher level of satisfaction.

4. Indifference curve must be convex to the origin: - This shows that the slope of theindifference curve decreases as we move along the curve from left to the right.

4. The Budget Constraint of the Consumer

The main objective of a rational consumer is to maximize his total utility by assigning his limited resources (income). The consumer's ability to allocate these commodity bundles depends on the prices of the commodities. The income and prices of the concerned commodities act as a constraint to the consumer's ability to consume the desired commodities. Jointly they form a budget constraint and when graphed, it gives the budget line.

1.3. Slutsky's Decomposition of price effect into substitution effect and income effect:

The Substitution Effect:

The concept of substitution effect put forward by J.R. Hicks. There is another important version of substitution effect put forward by E. Slutsky. The treatment of the substitution effect in these two versions has a significant difference. Since Slutsky substitution effect has an important empirical and practical use, we explain below Slutsky's version of substitution effect in some detail.

In Slutsky's version of substitution effect when the price of good changes and consumer's real income or purchasing power increases, the income of the consumer is changed by the amount equal to the change in its purchasing power which occurs as a result of the price change. His purchasing power changes by the amount equal to the change in the price multiplied by the number of units of the good which the individual used to buy at the old price.

In other words, in Slutsk's approach, income is reduced or increased (as the case may be), by the amount which leaves the consumer to be just able to purchase the same combination of goods, if he so desires, which he was having at the old price.

The substitution effect relates to the change in the quantity demanded resulting from a change in the price of good due to the substitution of relatively cheaper good for a dearer one, while keeping the price of the other good and real income and tastes of the consumer as constant. Prof. Hicks has explained the substitution effect independent of the income effect through compensating variation in income. "The substitution effect is the increase in the quantity bought as the price of the commodity falls, after adjusting income so as to keep the real purchasing power of the consumer the same as before. This adjustment in income is called compensating variations and is shown graphically by a parallel shift of the new budget line until it become tangent to the initial indifference curve."

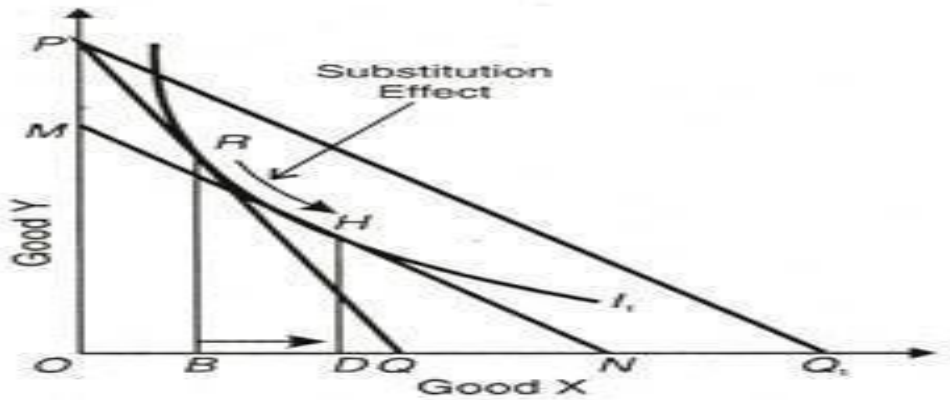
Thus on the basis of the methods of compensating variation, the substitution effect measure the effect of change in the relative price of a good with real income constant. The increase in the real income of the consumer as a result of fall in the price of, say good X, is so withdrawn that he is neither better off nor worse off than before.

The substitution effect is explained in Figure 12.17 where the original budget line is PQ with equilibrium at point R on the indifference curve I_1. At R, the consumer is buying OB of X and BR of Y. Suppose the price of X falls so that his new budget line is PQ_1. With the fall in the price of X, the real income of the consumer increases. To make the compensating variation in income or to keep the consumer's real income constant, take away the increase in his

income equal to PM of good Y or Q_1N of good X so that his budget line PQ_1 shifts to the left as MN and is parallel to it. At the same time, MN is tangent to the original indifference curve l_1 but at point H where the consumer buys OD of X and DH of Y. Thus PM of Y or Q_1N of X represents the compensating variation in income, as shown by the line MN being tangent to the curve I_1 at point H. Now the consumer substitutes X for Y and moves from point R to H or the horizontal distance from B to D. This movement is called the substitution effect. The substitution affect is always negative because when the price of a good falls (or rises), more (or less) of it would be purchased, the real income of the consumer and price of the other good remaining constant. In other words, the relation between price and quantity demanded being inverse, the substitution effect is negative.

In the above analysis of the consumer's equilibrium it was assumed that the income of the consumer remains constant, given the prices of the goods X and Y. Given the tastes and preferences of the consumer and the prices of the two goods, if the income of the consumer changes, the effect it will have on his purchases is known as the income Effect.

If the income of the consumer increases his budget line will shift upward to the right, parallel to the original budget line. On the contrary, a fall in his income will shift the budget line inward to the left. The budget lines are



parallel to each other because relative prices remain unchanged.

In Figure 12.14 when the budget line is PQ, the equilibrium point is R where it touches the indifference curve I_1. If now the income of the consumer increases, PQ will move to the right as the budget line P_1, I_1, and the new

equilibrium point is S where it touches the indifference curve I_2. As income increases further, PQ becomes the budget line with T as its equilibrium point. The locus of these equilibrium points R, S and T traces out a curve which is called the income-consumption curve (ICC). The ICC curve shows the income effect of changes in consumer's income on the purchases of the two goods, given their relative prices.

Normally, when the income of the consumer increases, he purchases larger quantities of two goods. In Figure he buys RA of Y and OA of X at the equilibrium point R on the budget line PQ. As his income increases, he buys SB of Y and OB of X at the equilibrium point S on P_1, Q_1, budget line and still more of the two goods TC of Y and OC of X, on the budget line P_2Q_2. Usually, the income consumption curve slopes upwards to the right as shown in Figure. But an income-consumption curve can have any shape provided it does not intersect an indifference curve more than once. We can have five

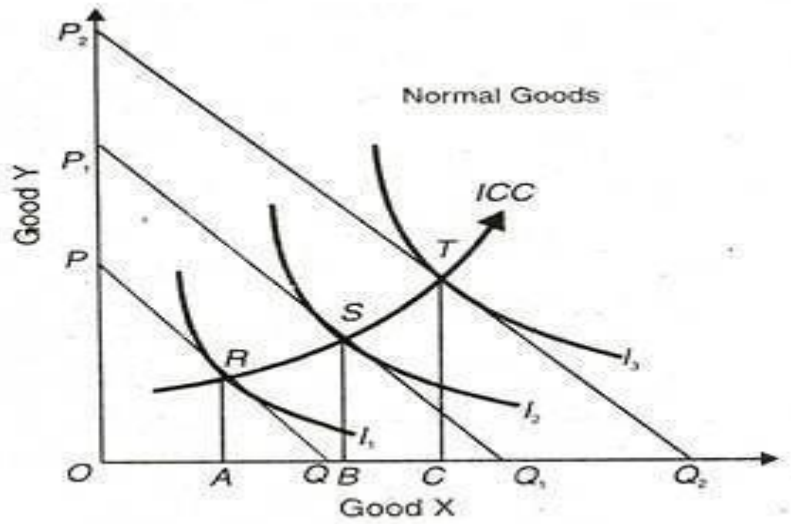


Fig. 12.14

types of income consumption curves. The first type is explained above in Figure 12.14 where the ICC curve has a positive slope throughout its range. Here the income effect is also positive and both X and Y are normal goods.

The second type of ICC curve may have a positive slope in the beginning but become and stay horizontal beyond a certain point when the income of the consumer continues to increase. In Figure 12.15 (A) the ICC curve slopes upwards with the increase in income upto the equilibrium point R at the budget line P_1Q_1 on the indifference cure I_2. Beyond this point it becomes

horizontal which signifies that the consumer has reached the saturation point with regard to the consumption of good Y. He buys the same amount of Y (RA) as before despite further increases in his income. It often happens in the case of a necessity (like salt) whose demand remains the same even when the income of the consumer continues to increase further. Here Y is a necessity.

Figure 12.15 (B) shows a vertical income consumption curve when the consumption of good X reaches the saturation level R on the part of the consumer. He has no inclination to increase its purchases despite further increases in his income. He continues to purchase OA of it even at higher income levels. Thus X is a necessity here.

The last two types of income consumption curves relate to inferior goods. The demand of inferior goods falls, when the income of the consumer increases beyond a certain level, and he replaces them by superior substitutes. He may replace coarse grains by wheat or rice, and coarse cloth by a fine variety. In Figure 12.15 (C), good Y is inferior and X is a superior or luxury good.

Upto point R the ICC curve has- a positive slope and beyond that it is negatively inclined. The consumer's purchases of Y fall with the increase in his income. Similarly in Figure 12.15 (D), good X is shown as inferior and Y is a superior good beyond the equilibrium point R when the ICC curve turns

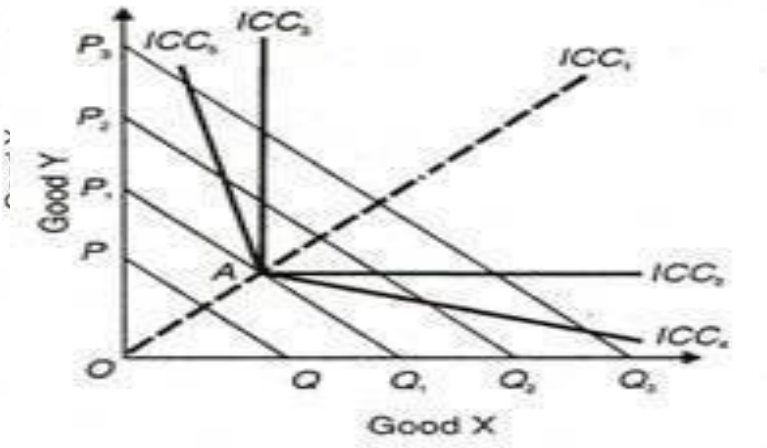


Fig. 12.16

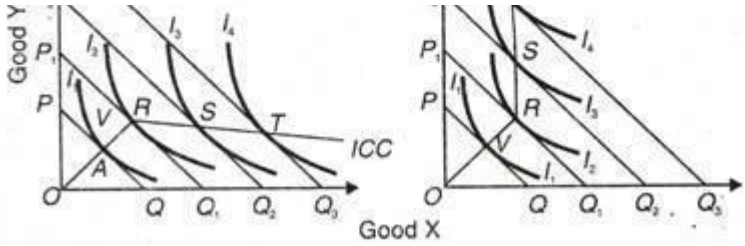


Fig. 12.15

back upon itself. In both these cases the income effect is negative beyond point R on the income-consumption curve ICC.

The different types of income-consumption curves are also shown in Figure 12.16 where: (1) ICC_1 Alternative Method, has a positive slope and relates to normal goods; (2) ICC_2 is horizontal from point A, X is a normal good while Y is a necessity of which the consumer does not want to have more than the usual quantity as his income increases further: (3) ICC_3 is vertical from A, K is a normal good here and X is satiated necessity; (4) ICC_4 is negatively inclined downwards, Y becomes an inferior good form A onwards and X is a superior good; and (5) ICC_5 shows X as an inferior good.

The Price Effect:

The price effect indicates the way the consumer's purchases of good X change, when its price changes, A given his income, tastes and preferences and the price of good Y. This is shown in Figure 12.18. Suppose the price of X falls. The budget line PQ will extend further out to the right as PQ_1, showing that the consumer will buy more X than before as X has become cheaper. The budget line PQ_2 shows a further fall in the price of X. Any rise in the price of

X will be represented by the budget line being drawn inward to the left of the original budget line towards the origin.

If we regard PQ_2, as the original budget line, a two time rise in the price of X will lead to the shifting of the budget line to PQ_1, and PQ_2. Each of the budget lines fanning out from P is a tangent to an indifference curve I_1, I_2, and I_3 at R, S and T respectively. The curve PCC connecting the locus of these equilibrium points is called the price- consumption curve. The price-consumption curve indicates the price effect of a change in the price of X on the consumer's purchases of the two goods X and Y, given his income, tastes, preferences and the price of good Y.

That is, the income is changed by the difference between the cost of the amount of good X purchased at the old price and the cost of purchasing the same quantity if X at the new price. Income is then said to be changed by the cost difference. Thus, in Slutsky substitution effect, income is reduced or increased not by compensating variation as in case of the Hicksian substitution effect but by the cost difference.

Income Effect: Income Consumption Curve (with curve diagram)

With a given money income to spend on goods, given prices of the two goods and given an indifference map (which portrays given tastes and preferences of the consumers), the consumer will be in equilibrium at a point in an indifference map.

We are interested in knowing how the consumer will react in regard to his purchases of the goods when his money income changes, prices of the goods and his tastes and preferences remaining unchanged. Income effect

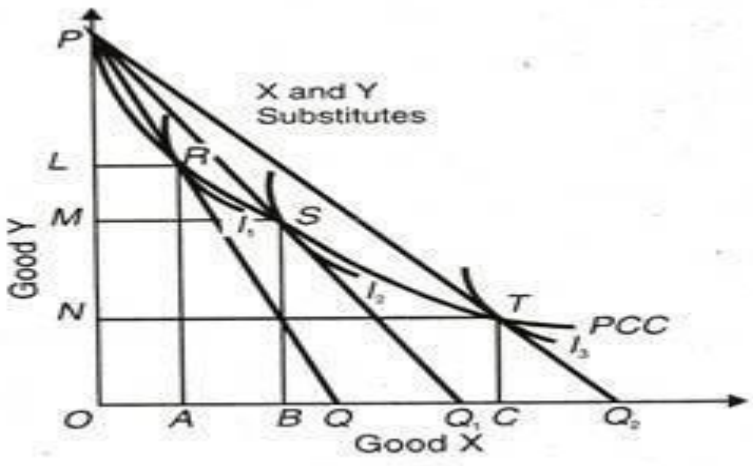
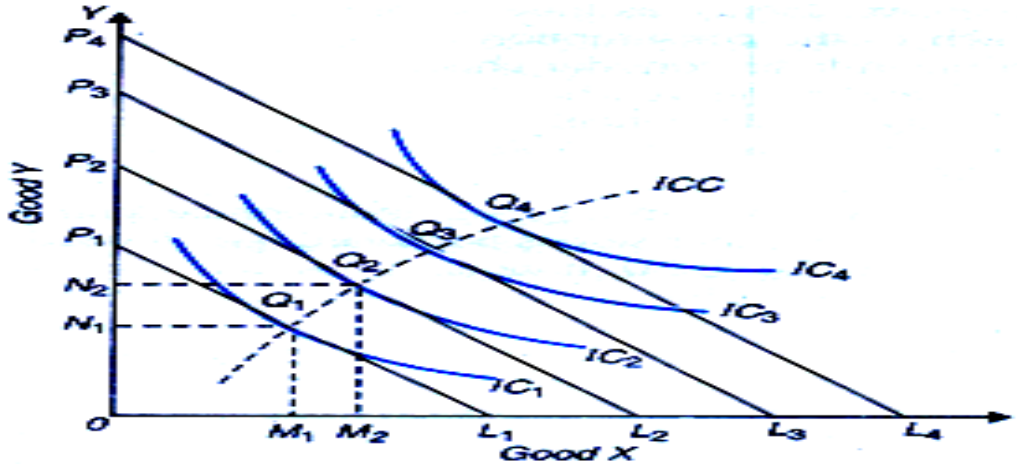


Fig. 12.18

shows this reaction of the consumer. Thus, the income effect means the change in consumer's purchases of the goods as a result of a change in his money income. Income effect is illustrated in Fig.1.1.



Income Consumption Curve: Income effect

With given prices and a given money income as indicated by the budget line P_1L_1 the consumer is initially in equilibrium at point Q_1 on the indifference curve IC_1 and is having OM_1 of X and ON_1 of Y. Now suppose that income of the consumer increases. With his increased income, he would be able to purchase larger quantities of both the goods.

As a result, budget line will shift upward and will be parallel to the original budget line P_1L_1. Let us assume that the consumer's money income increases by such an amount that the new budget line is P_2L_2 (consumer's income has increased by L_1L_2 in terms of X or P_1P_2 in terms of Y). With budget line P_2L_2, the consumer is in equilibrium at point Q_2 on indifference curves IC_2 and is buying OM_2 of X and ON_2 of Y.

Thus as a result of the increase in his income the consumer buys more quantity of both the goods Since he is on the higher indifference curve IC_2 he will be better off than before i.e., his satisfaction will increase. If his income increases further so that the budget line shifts to P_3L_3, the consumer is in equilibrium at point Q_3 on indifference curve IC_3 and is having greater quantity of both the goods than at Q_2.

Consequently, his satisfaction further increases. In Fig.1 the consumer's equilibrium is shown at a still further higher level of income and it will be seen that the consumer is in equilibrium at Q_4 on indifference curves

IC_4 when the budget line shifts to P_4L_4. As the consumer's income increases, he switches to higher indifference curves and as a consequence enjoys higher levels of satisfaction.

If now various points Q_1, Q_2, Q_3 and Q_4 showing consumer's equilibrium at various levels of income are joined together, we will get what is called Income Consumption Curve (ICC). Income consumption curve is thus the locus of equilibrium points at various levels of consumer's income. Income consumption curve traces out the income effect on the quantity consumed of the goods. Income effect can either be positive or negative.

Income effect for a good is said to be positive when with the increase in income of the consumer, his consumption of the good also increases. This is the normal good case. When the income effect of both the goods represented on the two axes of the figure is positive, the income consumption curve ICQ will slope upward to the right as in Figure. Only the upward- sloping income consumption curve can show rising consumption of the two goods as income increases.

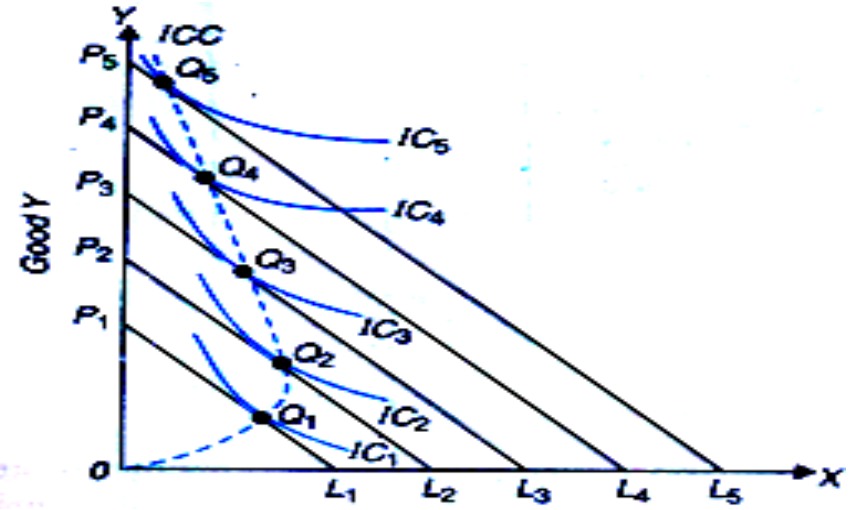
However, for some goods, income effect is negative. Income effect for a good is said to be negative when with the increases in his income, the consumer reduces his consumption of the good. Such goods for which income effect is negative are called Inferior Goods. This is because the goods whose consumption falls as income of the consumer rises are considered to be some way 'inferior' by the consumer and therefore he substitutes superior goods for them when his income rises.

When with the increase in his income, the consumer begins to consume superior goods, the consumption or quantity purchased by him of the inferior goods falls. When the people are poor, they cannot afford to buy the superior goods which are often more expensive. Hence as they become richer and can afford to buy more expensive goods they switch to the consumption of superior and better quality goods.

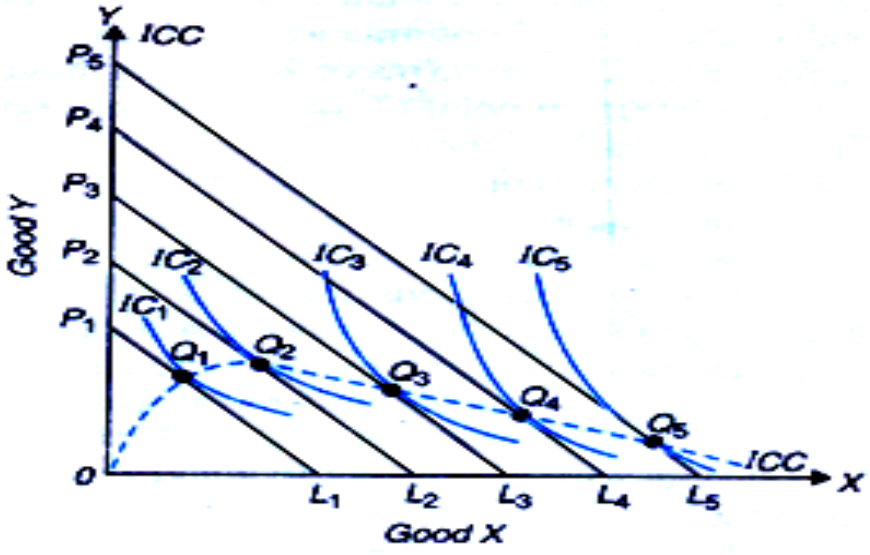
For instance, most of the people in India consider cheaper common food grains such as maize, jawar, bajra as inferior goods and therefore when their income rises, they shift to the consumption of superior varieties of food grains like wheat and rice. Similarly, most of the Indian people regard

Vanaspati Ghee to be inferior and therefore as they become richer, they reduce its consumption and use 'Desi Ghee instead.

In case of inferior goods, indifference map would be such as to yield income consumption curve which either slopes backward (i.e., toward the left) as in Figure or downward to the right as in Figure. It would be noticed from these two figures that income effect becomes negative only after a point. It signifies that only at higher ranges of income, some goods become inferior goods and up to a point their consumption behaves like those of normal goods. In Figure, income consumption curve (ICC) slopes backward i.e., bends toward the Y-axis.



Income consumption curve case of good x being Inferior goods. This shows good X to be an inferior good, since beyond point Q_2, income effect is negative for good X and as a result its quantity demanded falls as income



increases. In Figure income consumption curve (ICC) slopes downward to the right beyond point Q_2 bends towards the X-axis.

Income consumption curve in case of Good Y being inferior good. This signifies that good Y is an inferior good because beyond point Q_2, income effect is negative for good Y and as a result its quantity demanded falls as income increases. It follows from above that the income consumption curve can have various possible shapes.

But normal goods can be either necessities or luxuries depending upon whether the quantities purchased of the goods by the consumers increase less than or more than proportionately to the increases in income. If the quantity purchased of a commodity rises less than proportionately to the increases in consumer's income, the commodity is known as a necessity. On the other hand, if the quantity purchased of a commodity increases more than proportionately to the increases in income, it is called a luxury. In Figure the slope of income consumption curve ICC_1 is increasing which implies that the quantity purchased of the commodity X increases less than proportionately to the increases in consumer's income.

Therefore, in this case of ICC_1, good X is a necessity and good Vis luxury. On the other hand, the slope of income consumption curve ICC $_3$ is decreasing which implies that the quantity purchased of good X increases more than proportionately to increases in income and therefore in this case good X is luxury and good Vis necessity. It will be seen from Fig. that the income consumption curve ICC_2 is a linear curve passing through the origin which implies that the increases in the quantities purchased of both the goods are rising in proportion to the increase in income and therefore neither good is a luxury or a necessity.

If income effect is positive for both the goods X and Y, the income consumption curve will slope upward to the right as in Fig. Given earlier. But upward-sloping income consumption curves to the right for various goods may be of different slopes as shown in Fig. In which income consumption curves, with varying slopes, are all sloping upward and therefore indicate both goods to be normal goods having positive income effect.

If income effect for good X is negative, income consumption curve will slope backward to the left as ICC in figure if good Y happens to be an inferior good and income consumption curve will bend towards X-axis as shown by ICC" in Figure. In Figurs various possible shapes which income consumption curve can take are shown indifference curves and budget lines which yield them. It may however be pointed out that given an indifference map and a set of budget lines there will be one income consumption curve.

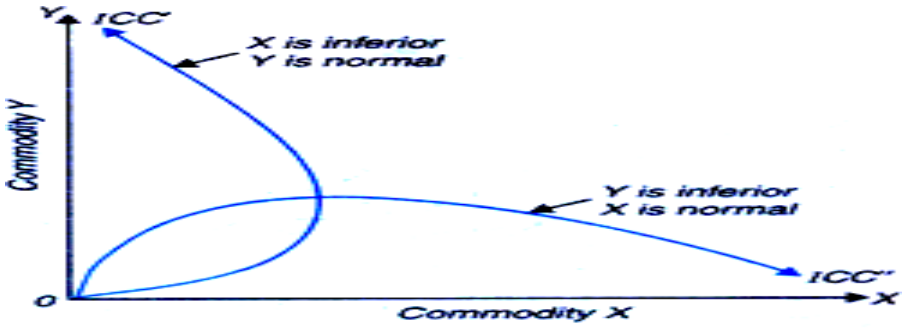
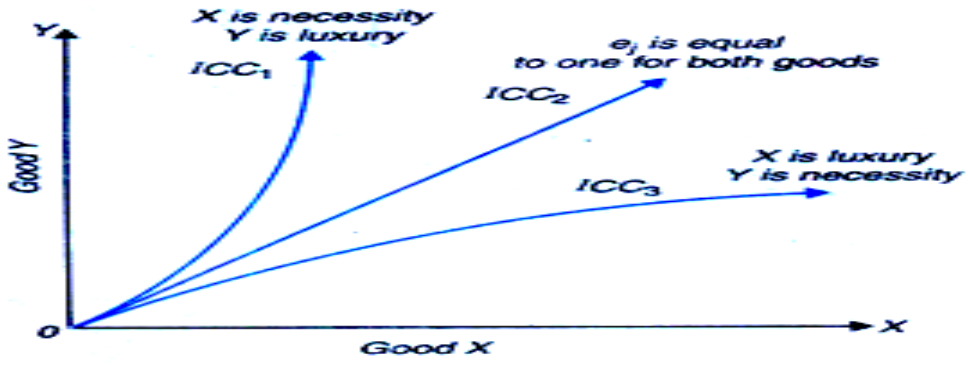


Fig. 8.32. *Income Consumption Curves of Inferior Goods*

Income consumption curves of normal goods



Income consumption curves of inferior goods

A noteworthy point is that it is not the indifference curves which explain why a good happens to be an inferior good. In other words, indifference curves do not explain why income effect for a good is negative. Indifference curves can only illustrate the inferior good phenomenon.

1.6. REVEALED PREFERENCE THEORY

Professor Samuelson's Revealed Preference Theory is a behaviourist ordinal utility analysis as distinct from the introspective ordinal utility theory of Hicks and Allen. It is 'the third root of the logical theory of demand', and has been called by Hicks as the Direct Consistency Test under strong ordering. This theory analyses consumer's preference for a combination of goods on the basis of observed consumer behaviour in the market.

Choice Reveals Preference:

Prof. Samuelson's theory of demand is based on the revealed preference axiom or hypothesis which states that choice reveals preference. Keeping this fact into view, a consumer buys a combination of two goods either because he likes this combination in relation to others or this is cheaper than others. Suppose the consumer buys combination A rather than combination B. C or D. It means that he reveals his preference for combination A. He can do this for two reasons. First, combination A may be cheaper than the other combinations B, C, D. Seconds combination A may be dearer than others and even then he likes it more than other combinations. In such a situation, it can be said that A is revealed preferred to B, C, D or B, C, D are revealed inferior to A. This is explained in Figure 14.1.

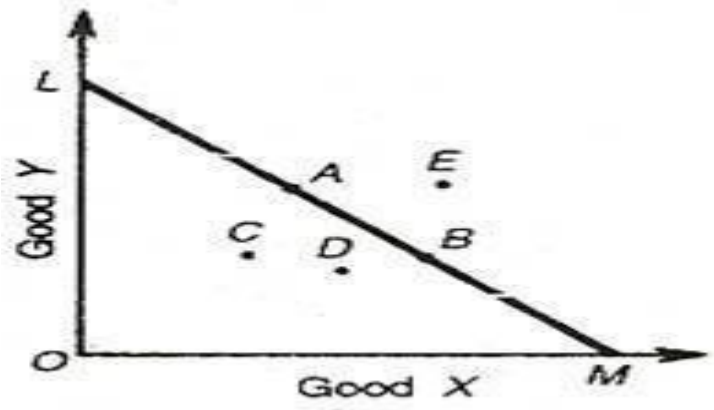


Figure 14.1

Given the income and prices of the two goods X and Y. LM is the price-income line of the consumer. The triangle OLM is the area of choice for the consumer which shows the various combinations of X and Y on the given price- income situation LM. In other words, the consumer can choose any combination between A and B on the line LM or between C and D below this line. If he chooses A, it is revealed preferred to B. Combinations C and D are revealed

inferior to A because they are below the price-income line LM. But combination E is beyond the reach of the consumer being dearer for him because it lies above his price-income line LM. Therefore, A is revealed preferred to other combinations within and on the triangle OLM.

Assumptions:

Samuelson's law of demand is based on the following assumptions:

(1) The consumer's tastes do not change.

(2) His choice for a combination reveals his preference for that.

(3) The consumer chooses only one combination at a given price-income line, i.e., any change in relative prices will always lead to some change in what he purchases.

(4) He prefers a combination of more goods to less in any situation.

(5) The consumer's choice is based on strong ordering.

(6) It assumes consistency of consumer behaviour. If A is preferred to B in one situation, B cannot be preferred to A in the other situation. This is the two-term consistency, according to Hicks which must satisfy two conditions on a straight line curve: (a) If A is left to B, B must be right of A. (b) If A is right of B, B must be left of A.

(7) This theory is based on the assumption of transitivity. Transitivity, however, refers to three-term consistency. If A is preferred to B, and B to C, then the consumer must prefer A to C. This assumption is necessary for the revealed preference theory if the consumer is to make a consistent choice from given alternative situations.

(8) Income elasticity of demand is positive i.e., more commodity is demanded when income increases, and less when income falls.

Fundamental Theorem or Demand Theorem:

Given these assumptions, Samuelson states his "Fundamental Theorem of Consumption Theory," also known as demand theorem, thus: "Any good (simple or composite) that is known always to increase in demand when money income alone rises must definitely shrink in demand when its price alone rises." It means that when income elasticity of demand is positive, price elasticity of demand is negative. This can be shown both in the case of a rise and a fall in the price of a good.

Rise in Price:

First, we take a rise in the price of, say, good X. To prove this Fundamental Theorem, let us divide it into two stages. Firstly, take a consumer who spends his entire income on two goods X and Y. LM is his original price-income line where the consumer is observed to have chosen the combination represented by R in Figure 14.2. The triangle OLM is the consumer's area of choice for the different combinations of V and Y available to him, as given by his price-income line LM. By choosing only the

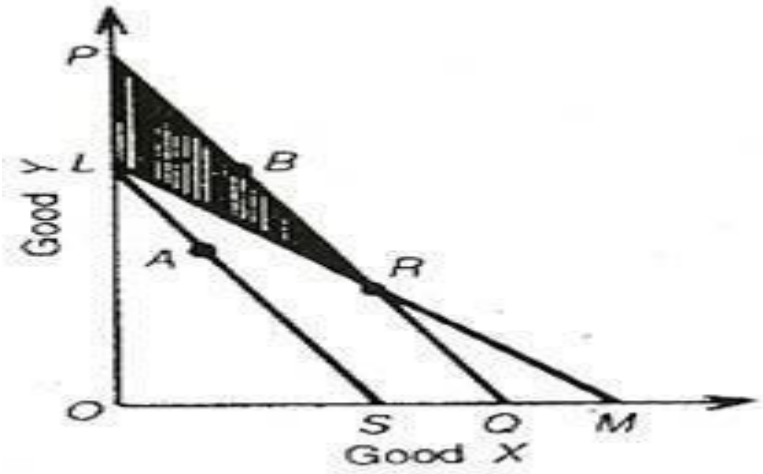


Figure 14.2

combination R. the consumer is revealed to have preferred this combination to all others in or on the triangle OLM.

Suppose the price of X rises, the price of Y remaining constant so that the new price-income line is LS. Now he chooses a new combination, say, point A which shows that the consumer will buy less of A than before as the price of A" has risen. In order to compensate the consumer for the loss in his real income as a result of rise in the price of X, let us give him LP amount of money in terms of good Y As a result, PQ becomes his new price-income line which is parallel to the LS line and passes through point R. Prof. Samuelson calls it Over Compensation Effect. Mow the triangle 0P0 becomes his area of choice. Since R was revealed preferred to any other point on the original price-income line LM, all points lying below R on the RQ segment of PO line will be inconsistent with consumer behaviour.

This is because he cannot have more of X when its price has risen. The consumer will, therefore, reject all combinations below R and choose either

combination R or ay other combination, say, B in the shaded area LRP on the segment PR of the price-income line PQ. If he chooses the combination R, he will buy the same quantities of X and Y which he was buying before the rise in the price of X. On the other hand, if he chooses the combination B, he will buy less of X and more of Y than before.

In the second stage, if the packet of extra money LP given to the consumer is taken back, he will be to the left of R at point A on the price-income line LS where he will buy less of X, if the income elasticity of demand for X is positive. Since with the rise in the price of X, its demand has fallen (when the consumer is at point A), it is proved when income elasticity is positive, price elasticity is negative.

With the rise in the price of X, the consumer buys less of X. So price elasticity of demands negative because price and demand move in the opposite directions. But with the rise in the price of X, the real income of the consumer falls and buys less of X. Therefore, his income elasticity of demand is positive because both income and demand move in the same direction.

Fall in Price:

The demand theorem can also be proved when the price of good X falls. It can be defined thus: "Any good (simple or composite) that is known always to decrease demand when money income alone falls must definitely expand in demand when its price alone falls." This is explained in Figure 14.3. LM is the original price-income line on which the consumer reveals his preference at point R. With the fall in the price of X, the price of Y remaining constant, his new price-income line is LS. The consumer reveals his preference on this line at, say, combination A which shows that he buys more of X than before.

movement from point R to A is the price effect as a result of fall in the price of X which has led to increase in its demand.

Suppose the increase in the real income of the consumer as a result of fall in the price of X is taken away from him in the form of LP quantity of Y. Now PQ becomes his new price-income line which is parallel to LS and passes through R. The new triangle OPQ becomes his area of choice. Since the consumer was revealing his preference at point R on the line LM, all points lying above R on

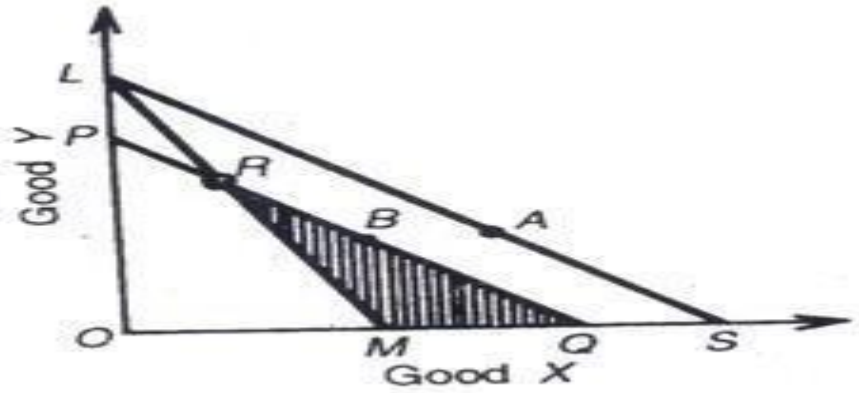


Figure 14.3

the segment RP of line PQ will be inconsistent with his choice.

This is because on the RP segment he will have less of good X when its price has fallen. But this is not possible. The consumer will, therefore, reject all combinations above R. He will either choose combination R or any other combination, say, B on the segment RQ of the line PQ in the shaded area MRQ. If he chooses the combination R, he will buy the same quantities of X and Y which he was buying before the fall in the price of X. And if he chooses the combination B, he will buy more of X and less of Y than before. The movement from R to B is the substitution effect of a fall in the price of X.

If the money taken from the consumer in the form of LP is returned to him, he will be at the old combination A on the price-income line LS where he will buy more of X with the fall in its price. The movement from B to A is the income effect. So the demand theorem is again proved that positive income elasticity means negative price elasticity of demand.

It is to be noted that Samuelson's explanation of the substitution effect is different from that of the indifference curve analysis. In the case of

indifference curve analysis, the consumer moves from one combination to another on the same indifference curve and his real income remains constant.

Conclusion:

It appears from the above discussion that the revealed preference approach is in no way an improvement over the indifference curve analysis of Hicks and Allen. It is unable to isolate the substitution effect from the income effect, neglects Giffen's Paradox and fails to study market demand analysis. But the fact is that in a single-valued demand function, the indifferent behaviour is replaced by the observed market behaviour of the consumer. This makes the revealed preference theory somewhat more realistic than the indifference curve technique.

1.6. CONSUMER SURPLUS

The concept of consumer surplus was first formulated by Dupit in 1844 to measure social benefits of public goods such as canals, bridges, national highways. Marshall further refined and popularised this in his 'Principles of Economics" published in 1890.

The concept of consumer surplus became the basis of old welfare economics. Marshall's concept of consumer's surplus was based on the cardinal measurability and interpersonal comparisons of utility. According to him, every increase in consumer's surplus is an indicator of the increase in social welfare. As we shall see below, consumer's surplus is simply the difference between the price that 'one is willing to pay' and 'the price one actually pays' for a particular product.

Concept of consumer's surplus is a very important concept in economic theory, especially in theory of demand and welfare economics. This concept is important not only in economic theory but also in formulation of economic policies such as taxation by the Government and price policy pursued by the monopolistic seller of a product.

The essence of the concept of consumer's surplus is that a consumer derives extra satisfaction from the purchases he daily makes over the price he actually pays for them. In other words, people generally get more utility from the consumption of goods than the price they actually pay for them.

It has been found that people are prepared to pay more price for the goods than they actually pay for them. This extra satisfaction which the consumers obtain from buying a good has been called consumer surplus.

Thus, Marshall defines the consumer's surplus in the following words: "excess of the price which a consumer would be willing to pay rather than go without a thing over that which he actually does pay is the economic measure of this surplus satisfaction…. it may be called consumer's surplus." The amount of money which a person is willing to pay for a good indicates the amount of utility he derives from that good; the greater the amount of money he is willing to pay, the greater the utility he obtains from it.

Therefore, the marginal utility of a unit of a good determines the price a consumer will be prepared to pay for that unit. The total utility which a person gets from a good is given by the sum of marginal utilities (IMU) of the units of a good purchased and the total price which he actually pays is equal to the price per unit of the good multiplied by the number of units of it purchased.

Thus:

Consumer's surplus = what a consumer is willing to pay minus what he actually pays.

The concept of consumer surplus is derived from the law of diminishing marginal utility. As we purchase more units of a good, its marginal utility goes on diminishing. It is because of the diminishing marginal utility that consumer's willingness to pay for additional units of a commodity declines as he has more units of the commodity. The consumer is in equilibrium when marginal utility from a commodity becomes equal to its given price. In other words, consumer purchases the number of units of a commodity at which marginal utility is equal to price. This means that at the margin what a consumer will be willing to pay (i.e., marginal utility) is equal to the price he actually pays. But for the previous units which he purchases, his willingness to pay (or the marginal utility he derives from the commodity) is greater than the price he actually pays for them. This is because the price of the commodity is given and constant for him and therefore price of all the units is the same.

Marshall's Measure of Consumer Surplus:

Consumer surplus measures extra utility or satisfaction which a consumer obtains from the consumption of a certain amount of a commodity over and above the utility of its market value. Thus the total utility obtained from consuming water is immense while its market value is negligible.

It is due to the occurrence of diminishing marginal utility that a consumer gets total utility from the consumption of a commodity greater than

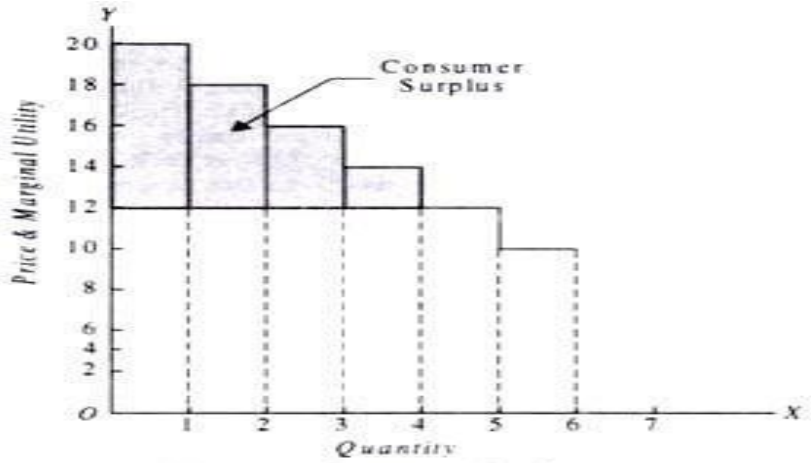


Fig. 14.1. *Consumer Surplus*

its market value. Marshall tried to obtain the monetary measure of this surplus, that is, how many rupees this surplus of utility is worth to the consumer.

It is the monetary value of this surplus that Marshall called consumer surplus. To determine this monetary measure of consumer surplus we are required to measure two things. First, the total utility in terms of money that a consumer expects to get from the consumption of a certain amount of a commodity. Second, the total market value of the amount of commodity consumed by him.

It is quite easy to measure the total market value as it is equal to market price of a commodity multiplied by its quantity purchased (i.e., P.Q.). An important contribution of Marshall has been the way he devised to determine the monetary measure of the total utility a consumer obtained from the commodity. Consider Table 14.1 which has been graphically shown in Fig. 14.1.

Suppose for the first unit of the commodity the consumer is prepared to pay Rs. 20. This means that the first unit of the commodity is at least worth Rs.

20 to him. In other words, he derives marginal utility equal to Rs. 20 from the first unit.

For the second unit of the commodity, he is willing to pay Rs. 18, that is, the second unit is at least worth Rs. 18 to him. This is in accordance with the law of diminishing marginal utility. Similarly, the marginal utility of the third, fourth, fifth and sixth units of the commodity fall to Rs. 16, 14, 12 and 10 respectively.

However, actually the consumer has not to pay the sum of money equal to the marginal utility or marginal valuation he places on them. For all the units of the commodity he has to pay the current market price of the commodity.

Suppose the current market price of the commodity is Rs. 12. It will be seen from the Table 14.1 and Fig. 14.1 that the consumer will buy 5 units of the commodity at this price because his marginal utility of the fifth unit just equals the market price of Rs. 12.

This shows that his marginal utility of the first four units is greater than the market price which he actually pays for them. He will therefore obtain surplus or net marginal benefit of Rs. 8 (Rs. 20 – 12) from the first unit, Rs. 6 (= Rs. 18-12) from the second unit, Rs. 4 from the third unit and Rs. 2 from the fourth unit and zero from the fifth unit. He thus obtains total consumer surplus or total net benefit equal to Rs. 20.

Table 14.1. Marginal Utility and Consumer Surplus

No. of Units	*Marginal Utility*	*Price*	*Net Marginal Benefit*
1	Rs. 20	Rs. 12	Rs. 8
2	Rs. 18	Rs. 12	Rs. 6
3	Rs. 16	Rs. 12	Rs. 4
4	Rs. 14	Rs. 12	Rs. 2
5	Rs. 12	Rs. 12	Rs. 0
6	Rs. 10	Rs. 12	Rs. (– 2)
	Total Consumer Surplus (from 5 units)		= 20

Measurement of Consumer Surplus as an Area under the Demand Curve:

The analysis of consumer surplus made above is based on discrete units of the commodity. If we assume that the commodity is perfectly divisible, which is usually made in economic theory, the consumer surplus can be represented by an area under the demand curve.

The measurement of consumer surplus from a commodity from the demand or marginal utility curve is illustrated in Fig. 14.2 in which along the X-axis the amount of the commodity has been measured and on the Y-axis the marginal utility (or willingness to pay for the commodity) and the price of the commodity are measured. DD' is the demand or marginal utility curve which is sloping downward, indicating that as the consumer buys more units of the commodity falls, marginal utility of the additional units of the commodity. As said above, marginal utility shows the price which a person is willing to pay for the different units rather than go without them.

If OP is the price that prevails in the market, then the consumer will be in equilibrium when he buys OM units of the commodity, since at OM units,

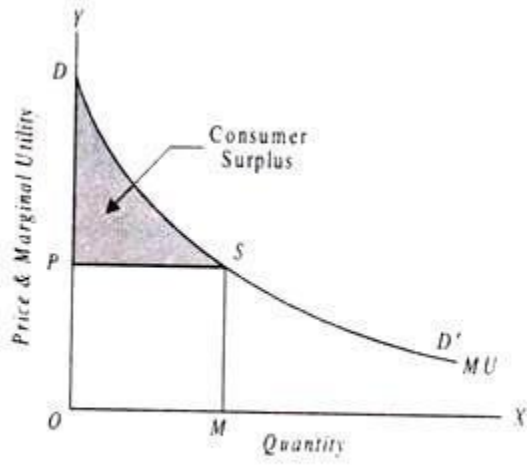


Fig. 14.2. *Marshall's Measure of Consumer's Surplus*

marginal utility from a unit of the commodity is equal to the given price OP. The Mth unit of the commodity does not yield any consumer's surplus to the consumer since this is the last unit purchased and for this price paid is equal to the marginal utility which indicates the price that he is prepared to pay rather than go without it. But for the intra-marginal units i.e., units before Mth unit, marginal utility is greater than the price and. therefore, these units yield consumer's surplus to the consumer. The total utility of a certain quantity of a commodity to a consumer can be known by summing up the marginal utilities of the various units purchased.

In Fig. 14.2, the total utility derived by the consumer from OM units of the commodity will be equal to the area under the demand or marginal utility curve up to point M. That is, the total utility of OM units in Fig. 14.2 is equal

to ODSM. In other words, for OM units of the good the consumer will be prepared to pay the sum equal to Rs. ODSM. But given the price equal to OP, the consumer will actually pay the sum equal to Rs. OPSM for OM units of the good. It is thus clear that the consumer derives extra utility equal to ODSM minus OPSM = DPS, which has been shaded in Fig. 14.2. To conclude when we draw a demand curve, the monetary measure of consumer surplus can be obtained by the area under the demand curve over and above the rectangular area representing the total market value (i.e., PQ. or the area OPSM) of the amount of the commodity purchased.

If market price of the commodity rises above OP, the consumer will buy fewer units of the commodity than OM. As a result, consumer's surplus obtained by him from his purchase will decline. On the other hand, if price falls below OP, the consumer will be in equilibrium when he is purchasing more units of the commodity than OM. As a result of this, the consumer's surplus will increase. Thus, given the marginal utility curve of the consumer, the higher the price, the smaller the consumer's surplus and the lower the price, the greater the consumer's surplus.

It worth noting here that in our analysis of consumer's surplus, we have assumed that perfect competition prevails in the market so that the consumer faces a given price, whatever the amount of the commodity he purchases.

But if seller of a commodity discriminates the prices and charges different prices for the different units of the good, some units at a higher price and some at a lower price, then in this case consumer's surplus will be smaller. Thus, when the seller makes price discrimination and sells different units of a good at different prices, the consumer will obtain smaller amount of consumer's surplus than under perfect competition. If the seller indulges in perfect price discrimination, that is, if he charges price for each unit of the commodity equal to what any consumer will be prepared to pay for it, then in that case no consumer's surplus will acquire to the consumer.

Consumer Surplus and Gain from a Change in Price:

In our above analysis consumer's surplus has been explained by considering the surplus of utility or its money value which a consumer obtains from a given quantity of the commodity rather than nothing at all.

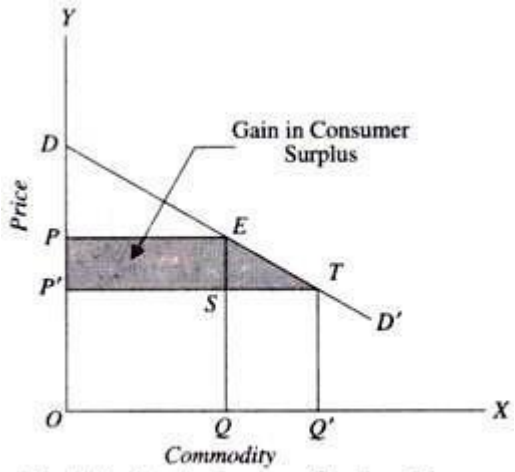


Fig. 14.3. *Gain in Consumer Surplus with a Fall in Price*

However, viewing consumer surplus derived by the consumer from his consumption of a commodity by considering it in all or none situation has rather limited uses. In a more useful way, consumer's surplus can be considered as net benefit or extra utility which a consumer obtains from the changes in price of a good or in the levels of its consumption.

Consider Fig. 14.3 where DD shows the demand curve for food. At a market price OP of the food, the consumer buys OQ quantity of the food. The total market value which he pays for OQ food is equal to the area OPEQ, that is, price OP multiplied by quantity OQ. The total benefit, utility or use-value of OQ quantity of food is the area ODEQ. Thus, consumer's surplus obtained by the consumer would be equal to the area PED. Now, if price of food falls to OP', the consumer will buy OQ' quantity of food and the consumer surplus will increase to P 'TD. The net increase in the consumer's surplus as a result of fall in price is the shaded area PETP', (P'TD – PED = PETP'). This measures the net benefit or extra utility obtained by the consumer from the fall in price of food. This net benefit can be decomposed into two parts. First, the increase in consumer surplus arising on consuming previous OQ quantity of food due to fall in price. Second, the increase in consumer surplus equal to the small triangle EST arising due to the increase in consumption of the food following the lowering of its price (PETP'- PESP' + EST).

Measurement of Consumer's Surplus through Indifference Curve Analysis:

We have explained above the Marshallian method of measuring consumer's surplus. Marshallian method has been criticised by the advocates of ordinal utility analysis.

Two basic assumptions made by Marshall in his measurement of consumer's surplus are:

(1) Utility can be quantitatively or cardinally measured, and

(2) When a person spends more money on a commodity, the marginal utility of money does not change or when the price of a commodity falls and as a result consumer becomes better off and his real income increases, the marginal utility of money remains constant.

Economists like Hicks and Allen have expressed the view that utility is a subjective and psychic entity and, therefore, it cannot be cardinally measured. They further point out that marginal utility of money does not remain constant with the rise and fall in real income of the consumer following the changes in price of a commodity.

The implication of Marshallian assumption of constant marginal utility of money is that he neglects the income effect of the price change. But in some cases income effect of the price change is very significant and cannot be ignored.

Marshall defended his assumption of constancy of marginal utility of money on the ground that an individual spends a negligible part of his income on an individual commodity and, therefore, a change in its price does not make any significant change in the marginal utility of money. But this need not be so in case of all commodities.

Prof. J.R. Hicks rehabilitated the concept of consumer's surplus by measuring it with indifference curve technique of his ordinal utility analysis. Indifference curve technique does not make the assumption of cardinal measurability of utility, nor does it assume that marginal utility of money remains constant. However, without these invalid assumptions, Hicks was able to measure the consumer's surplus with his indifference curve technique.

The concept of consumer's surplus was criticised mainly on the ground that it was difficult to measure it in cardinal utility terms. Therefore, Hicksian

measurement of consumer's surplus in terms of ordinal utility went a long way in establishing the validity of the concept of consumer's surplus.

How consumer's surplus is measured with the aid of Hicksian indifference curve technique is illustrated in Fig. 14.4. In Fig. 14.4, we have measured the quantity of commodity X along the X-axis, and money along the Y-axis. It is worth noting that money represents other goods except the commodity X. We have also shown some indifference curves between the given commodity X and money for the consumer, the scale of his preference being given. We know that consumer's scale of preferences depends on his tastes and is quite independent of his income and market prices of the good. This will help us in understanding the concept of consumer's surplus with the aid of indifference curves.

Suppose, a consumer has OM amount of money which he can spend on the commodity X and the remaining amount on other goods. The indifference curve IC_1 touches the point M indicating thereby that all combinations of money and commodity represented on the indifference curve IC_1 give the same satisfaction to the consumer as OM amount of money.

For example, take combination R on an indifference curve IC_1. It follows that OA amount of commodity X and OS amount of money will give the same satisfaction to the consumer as OM amount of money because both M and R combinations lie on the same indifference curve IC_1.

In other words, it means that the consumer is willing to pay MS amount of money for OA amount of the commodity X. It is thus clear that, given the scale

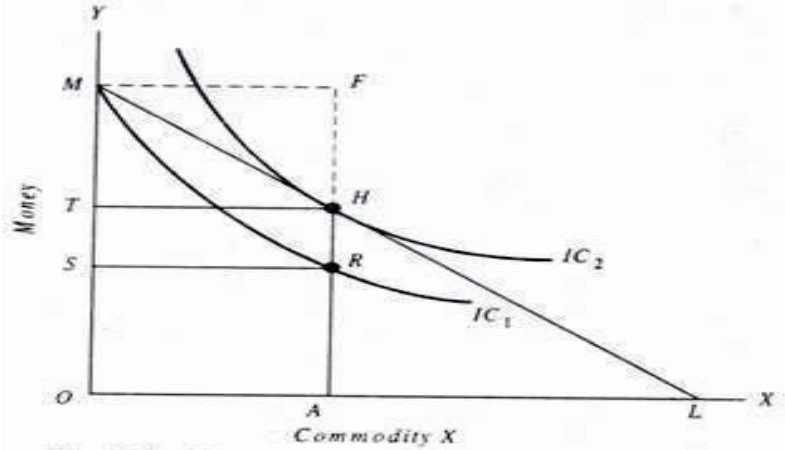


Fig. 14.4. *Measurement of Consumer Surplus with Indifference Curves*

of preferences of the consumer, he derives the same satisfaction from OA

amount of the commodity X as from MS amount of money. In other words, he is prepared to give up MS (or FR) for OA amount of commodity X.

Now, suppose that the price of commodity X in the market is such that we get the budget line ML (price of X is equal to OM/OL). We know from out analysis of consumer's equilibrium that consumer is in equilibrium where the given budget line is tangent to an indifference curve. It will be seen from Fig. 14.4 that the budget line ML is tangent to the indifference curve IC_2 at point H, where the consumer is having OA amount of commodity X and OT amount of money.

Thus, given the market price of the commodity X, the consumer has actually spent MT amount of money for acquiring OA amount of commodity X. But, as mentioned above, he was prepared to forego MS (or FR) amount of money for having OA amount of X.

Therefore, the consumer actually pays TS or HR less amount of money than he is prepared to pay for OA amount of the commodity X rather than go without it. Thus, TS or HR is the amount of consumer's surplus which the consumer derives from purchasing OA amount of the commodity.

In this way Hicks explained consumer's surplus with his indifference curves technique without assuming cardinal measurability of utility and without assuming constancy of the marginal utility of money. Since Marshall made these dubious assumptions for measuring consumer surplus, his method of measurement is regarded as invalid and Hicksian method of measurement with the technique of indifference curves is regarded as superior to the Marshallian method.

Critical Evaluation of the Concept of Consumer's Surplus:

The concept of consumer's surplus has been severely criticised ever since Marshall propounded and developed it in his Principles of Economics. Critics have described it as quite imaginary, unreal and useless. Most of the criticisms of the concept have been levelled against the Marshallian method of measuring it as an area under the demand curve. However, some critics have challenged the validity of the concept itself.

Check Your Progress:

Q.No	Short Questions	LOCF Mapping		
1.	Describe the Slutsky's decomposition of price effect.	K1	CO1	PO1
2.	Illustrate law of diminishing marginal utility and its impact.	K2	CO2	PO2
3.	Describe the causes of income consumption curve.	K2	CO1	PO2
4.	Develop the methodology of income effect.	K4	CO2	PO4
5.	Demonstrate consumer surplus with examples.	K3	CO3	PO3
Q.No	**Essay Type Questions**	**LOCF Mapping**		
1.	Assess diagrammatically the revealed preference theory and its role.	K5	CO4	PO4
2.	Distinguish between cardinal and ordinal utility. Give few examples.	K4	CO1	PO2
3.	Critically examine the principles, tools and valuation of methods decision making under conditions of uncertainty.	K5	CO5	PO4
4.	Recall the components of indifference curve approach and its role.	K1	CO2	PO1
5.	Debate the shortfall of Marginal utility schedule for money income through its guidelines.	K5	CO3	PO4

UNIT – II

ECONOMICS OF INFORMATION

2.1. INTRODUCTION

Asymmetric Information

The model of perfect competition is based on the assumption of perfect information. But, in reality, no economic participant can have full, efficient, and perfect information. This means that consumers and producers make decisions under uncertainty.

In other words, mistakes and errors in business decisions appear if information is incomplete and imperfect. Earlier market failures were ascribed to public goods and externalities. Today a new theory, known as "Economics of Information" has been developed that relates market failure to imperfect and costly information.

As uncertainty is the permanent feature of an economic system, economic participants may at least develop imperfect information. By 'imperfect information' we mean absence of certain knowledge about the probability of an outcome.

On the other hand, information is asymmetric when one participant, say, a seller, has better information than others, say, a buyer, about the probability of an outcome. However, asymmetric information is closely related to the concept of incomplete information. The idea of asymmetric information is at the core of "Economics of Information".

Informational asymmetry arises when economic agents to a transaction have different information about the transactions. It may happen that the suppliers may have better information than the buyers about the quality of the product. Here, as the buyers have little or no knowledge about the quality of the product, informed agents (i.e., sellers) have the tendency to exploit the uninformed or under-informed buyers.

The most frequently cited example of asymmetric information is the market of automobiles where both defective and second-hand cars and good or brand-new cars are sold. In the case of second-hand cars, an asymmetry of information arises between buyers and sellers since the

seller has the full information about the quality of the car than the prospective buyers.

Since information is a 'costly commodity', sellers usually do not give all kinds of information to the buyers. Authors of this theory have demonstrated that bad cars tend to drive the good cars out of the market. The man who popularized this new branch of economics in 1970 was the Nobel Prize winning economist George Akerlof.

Implications of Asymmetric Information: Adverse Selection and Moral Hazard:

The problems of adverse selection and moral hazard may arise in the case of incomplete and imperfect information such as old car market, insurance market, and health market.

Market participants, i.e., buyers and sellers, may have different levels of information. One party may have more information about the hidden or unobservable qualities of the product than other participants. For instance, in the second-hand car market, a seller is more informed about the true quality of his car.

He does not like to communicate the true quality of the car to the uninformed or less informed buyers. Sellers have the tendency to exploit the uninformed buyers and, in the process, the buyer draws a selection of goods with relatively less attractive features.

Thus, adverse selection arises in market transactions when one party knows more about the quality of the product than the second party, and, as a result, low quality goods are sold in large numbers than high-quality goods. In other words, adverse selection is a tendency of an informed agent to gain more from trading with less informed agent. Adverse selection may, thus, be called a "hidden information" problem.

Let us consider the example of the health insurance market. Unhealthy people have the tendency to buy health insurance against any illness. Insurance companies may not have full knowledge about the state of health of the party concerned. Unhealthy people are eager to insure more than the healthy people.

Insurance companies go on insuring the health of these people to enlarge their business, Low-risk healthy persons are not anxious to have this kind of transaction with the insurance companies. This is called adverse selection in the insurance market.

Moral hazard is something different from adverse selection. Moral hazard exists when an individual alters his or her behaviour after buying the product. People who purchase health or car or fire insurance face the problem of moral hazard.

Everybody knows that 'Smoking is injurious to health'. An insured person may be induced to go on smoking more cigarettes in a day since in case of any eventuality he knows that his costs of treatment will be borne by the insurance company.

Because of moral hazard, people act less carefully since they do not have to bear the cost for their carelessness. Moral hazard refers to situations where one of the parties cannot observe the actions of the other party because of incomplete information. Moral hazard may thus be called a "hidden action" problem.

It is impossible to know everything about the behaviour of the party concerned as well as the true quality of the product. Under the circumstance, market exchanges are not efficient. Cheating and fraudulent practices take place. Ultimately, this leads to inefficient resource allocation in the market.

2.2. Adverse Selection

Adverse selection refers generally to a situation in which sellers have information that buyers do not have, or vice versa, about some aspect of product quality—in other words, it is a case where asymmetric information is exploited. Asymmetric information, also called information failure, happens when one party to a transaction has greater material knowledge than the other party.

In the case of insurance, adverse selection is the tendency of those in dangerous jobs or high-risk lifestyles to purchase products like life insurance. In these cases, it is the buyer who actually has more knowledge (e.g., about

their health). To fight adverse selection, insurance companies reduce exposure to large claims by limiting coverage or raising premiums.

Understanding Adverse Selection

Adverse selection occurs when one party in a negotiation has relevant information the other party lacks. The asymmetry of information often leads to making bad decisions, such as doing more business with less-profitable or riskier market segments.

In the case of insurance, avoiding adverse selection requires identifying groups of people more at risk than the general population and charging them more money. For example, life insurance companies go through underwriting when evaluating whether to give an applicant a policy and what premium to charge.

Underwriters typically evaluate an applicant's height, weight, and current health, medical history, family history, occupation, hobbies, driving record, and lifestyle risks such as smoking; all these issues impact an applicant's health and the company's potential for paying a claim. The insurance company then determines whether to give the applicant a policy and what premium to charge for taking on that risk.

Adverse Selection in the Marketplace

A seller may have better information than a buyer about products and services being offered, putting the buyer at a disadvantage in the transaction. For example, a company's managers may more willingly issue shares when they know the share price is overvalued compared to the real value; buyers can end up buying overvalued shares and lose money. In the second-hand car market, a seller may know about a vehicle's defect and charge the buyer more without disclosing the issue.

Adverse Selection in Insurance

Because of adverse selection, insurers find that high-risk people are more willing to take out and pay greater premiums for policies. If the company charges an average price but only high-risk consumers buy, the company takes a financial loss by paying out more benefits or claims.

However, by increasing premiums for high-risk policyholders, the company has more money with which to pay those benefits. For example, a life

insurance company charges higher premiums for race car drivers. A car insurance company charges more for customers living in high crime areas. A health insurance company charges higher premiums for customers who smoke. In contrast, customers who do not engage in risky behaviours are less likely to pay for insurance due to increasing policy costs.

A prime example of adverse selection in regard to life or health insurance coverage is a smoker who successfully manages to obtain insurance coverage as a non-smoker. Smoking is a key identified risk factor for life insurance or health insurance, so a smoker must pay higher premiums to obtain the same coverage level as a non-smoker. By concealing his behavioural choice to smoke, an applicant is leading the insurance company to make decisions on coverage or premium costs that are adverse to the insurance companies' management of financial risk.

Another example of adverse selection in the case of auto insurance would be a situation where the applicant obtains insurance coverage based on providing a residence address in an area with a very low crime rate when the applicant actually lives in an area with a very high crime rate. Obviously, the risk of the applicants vehicle being stolen, vandalized, or otherwise damaged when regularly parked in a high-crime area is substantially greater than if the vehicle was regularly parked in a low-crime area.

Adverse selection might occur on a smaller scale if an applicant states that the vehicle is parked in a garage every night when it is actually parked on a busy street.

2.3. Moral Hazard

In economics, moral hazard occurs when someone increases their exposure to risk when insured, especially when a person takes more risks because someone else bears the cost of those risks. A moral hazard may occur where the actions of one party may change to the detriment of another after a financial transaction has taken place.

A party makes a decision about how much risk to take, while another party bears the costs if things go badly, and the party isolated from risk behaves differently from how it would if it were fully exposed to the risk. Moral hazard

can occur under a type of information asymmetry where the risk-taking party to a transaction knows more about its intentions than the party paying the consequences of the risk. More broadly, moral hazard can occur when the party with more information about its actions or intentions has a tendency or incentive to behave inappropriately from the perspective of the party with less information.

Moral hazard also arises in a principal-agent problem, where one party, called an agent, acts on behalf of another party, called the principal. The agent usually has more information about his or her actions or intentions than the principal does, because the principal usually cannot completely monitor the agent. The agent may have an incentive to act inappropriately (from the viewpoint of the principal) if the interests of the agent and the principal are not aligned.

For example, with respect to the originators of subprime loans, many may have suspected that the borrowers would not be able to maintain their payments in the long run and that, for this reason, the loans were not going to be worth much. Still, because there were many buyers of these loans (or of pools of these loans) willing to take on that risk, the originators did not concern themselves with the potential long-term consequences of making these loans. After selling the loans, the originators bore none of the risk so there was little to no incentive for the originators to investigate the long-term value of the loans.

2.4. Principal-Agent Problem

A principal-agent problem is when there is a conflict of interest between the agent and the principal, which typically occurs when the agent acts solely in his/her own interests. In a principal-agent relationship, the principal is the party that legally appoints the agent to make decisions and take actions on its behalf. This type of framework is used to model human behaviour and how it affects the finance body of knowledge. To learn more about similar topics you can take CFI's behavioural finance fundamentals course that explores the fundamental issues of psychology on the behaviour of financial agents. The separation of the "ownership" (principal) and the "control" (agent) in principal-

agent relationships creates the grounds for the conflict of interests between the two parties.

Reasons behind Principal-Agent Problems

The main reasons for the principal-agent problem are conflicts of interests between two parties and the asymmetric information between them (agents tend to possess more information than principals). The principal-agent problem generally results in agency costs that the principal should bear. Because agents can act in their interests at the principals' expense, the principle- agent problem is an example of a moral hazard.

The principle-agent problem was conceptualized in 1976 by American economists Michael Jensen and William Meckling. The principal-agent problem has applications in the political science and the economics. The problem is especially significant in the understanding of corporate governance.

Examples of Principal-Agent Problem

The following cases are the most common illustrations of the principal-agent problem:

Shareholders (principle) vs. management (agent)

Voters (principle) vs. politicians (agent)

Financial institutions (principle) vs. rating agencies (agent)

Solutions to Principal-Agent Problems

Solutions to the principal-agent problem aim to align the interest of both parties. There are two main areas of improvement to address the problem:

1. Contract design

The main purpose of contract design is the creation of a contract framework between the principal and the agent to address issues of information asymmetry, stimulate the agent's incentives to act in the interests of the principle, and determine monitoring procedures.

2. Performance evaluation and compensation

The agent's compensation is the primary method of aligning the interests of both parties. In order to address the principal-agent problem, the compensation must be linked to the performance of the agent. The performance of the agents is measured by subjective evaluation because it is

a more flexible and balanced assessment of complex jobs. The most common methods of agents' compensation include stock options, profit-sharing, and deferred compensation. Nevertheless, these types' compensations alone are not the panacea for the principle-agent problem.

2.5. The Market for Lemons

"The Market for 'Lemons'" is a key article written by George Akerlof in 1970, which aims to explain some of the market failures derived from imperfect information, in this case asymmetry. The paper itself is available on the bibliography and is characterised by its approachability and humour: as Akerlof himself stated, he lacked the mathematical dexterity to fully model the problem (although this has later been done by a host of economists, of which Hal Varian's analysis is probably the most well-known).

We are presented with the problem of someone who wants to buy a car, and decides to scout the used car market for a bargain. The market itself is composed of two types of cars: those that are being sold in good faith and those that are being sold off because they are known to be unreliable: these are the 'lemons' (in US slang). The seller, of course, knows how good the car is: they've had time to decide. The buyer, however, comes to the market blind: all they have to go on is the average quality of the used car market (which Akerlof defines as μ) and the price of the car, p. obviously, all similar models of cars need to be sold for an identical price, p. If we sell below market price, be it a lemon or not, we are sending out signals that the car is worth less than the market price, leading buyers to assume it is a lemon. However, it is also logical to assume that, if we know the car we are selling is reliable, we will want more than the average market price, because that average includes a proportion of lemons.

Therefore, two prices are naturally set up: one for the lemons (say 1000$), and one for the good cars (sometimes called 'cherries' or 'plums'), say 2500$. Below these prices, the seller will not be willing to let go of their vehicle and would derive greater utility from keeping it.

Above this price, they would rather sell. The problem is, therefore, that competition will naturally drive down the price to one below which the honest

seller are willing to go. Buyers will not be willing to pay 2500$ knowing that there is a probability that what they are buying is really a lemon: they need to reflect the premium related to the uncertainty derived from the asymmetrical information in a lower price. Lemon seller will be able to assume this drop in price, all the way down to 1000$, but honest sellers will not. Eventually, all that will be left in the market will be an orchard of lemons, but no cherries nor plums.

Causes and Consequences of the Lemons Problem

The problem of asymmetrical information arises because buyers and sellers dont have equal amounts of information required to make an informed decision regarding a transaction. The seller or holder of a product or service usually knows its true value, or at least knows whether it is above or below average in quality. Potential buyers, however, typically do not have this knowledge, since they are not privy to all the information the seller has.

Original example of the purchase of a used car noted that the potential buyer of a used car cannot easily ascertain the true value of the vehicle. Therefore, they may be willing to pay no more than an average price, which they perceive as somewhere between a bargain price and a premium price. Adopting such a stance may at first appear to offer the buyer some degree of financial protection from the risk of buying a lemon. Akerlof pointed out, however, that this stance actually favors the seller, since receiving an average price for a lemon would still be more than the seller could get if the buyer had the knowledge that the car was a lemon. Ironically, the lemons problem creates a disadvantage for the seller of a premium vehicle, since the potential asymmetric information, and the resulting fear of getting stuck with a lemon, means that they are not willing to offer a premium price for a vehicle of superior value.

2.6. Dealing with Risk and Uncertainty

The future always brings surprises. Sometimes the surprises are nice but often they are unpleasant. Many people want ways to protect themselves from the unpleasant surprises. Occasionally risk and uncertainty can be shifted to a person willing to bear them.

While most people consider risk a problem, a speculator sees it as an opportunity. A speculator takes risks in the hope of making a profit, usually by forecasting future prices and betting his money that he is correct. If a speculator expects the price of gold to be higher in a year than it is now, he can buy gold and wait. If he is right, he will make a profit on his action, while if he is wrong, he will lose.

The development of futures markets allows anyone who wants to be a speculator to become one. In a futures market agreements to buy and sell at a future date are made with the price set when the agreement is made. There are futures markets for most major agricultural commodities. Farmers use them to fix the price of their crop long before harvest and millers and owners of feedlots use them to lock in the price they will pay for grain in the coming year. In fixing these prices with a futures contract, farmers and buyers of grain reduce the risk they take by hedging. They are able to reduce their risk because speculators are willing to take risk. Without speculators, a futures market could not function properly.

The speculator is widely regarded as someone who contributes nothing positive to the economy because he produces nothing. However, by buying when prices are low and selling when they are high, the successful speculator transfers goods from low-valued uses to high-valued ones, which is a useful task. He also price fluctuations because his purchases increases prices when they are low, and his sales when prices are high helps keep prices from going even higher. The benefits that speculators provide others are not part of their intentions, an example of the unintended consequences in which economists delight.

A person involved in speculation is not engaged in arbitrage, he is not a middleman, nor is he an entrepreneur. Arbitrage is buying in a market where prices are low and simultaneously selling in a different market in which they are high. There is no risk involved in pure arbitrage. Arbitrage tends to equalize prices in various markets. A middleman is part of a distribution or marketing network. Although frequently disparaged, the fact that sellers use middlemen indicates that they perform useful services. Middlemen generally try to keep risk to a minimum.

An entrepreneur deals in risk, but unlike the speculator who reduces the risk of those who do not want to bear it, the entrepreneur's risk is of his own making. The entrepreneur is the creative element in a market economy. His presence makes the system dynamic and ever-changing. Although the abstract theory of the exchange economy is a static theory emphasizing equilibrium, real-world market economies are always changing. The entrepreneur, the innovator, is a source of change. He creates new products, develops new managerial techniques, introduces new ways of producing products, and finds new resources. His role can be understood if one looks at Darwin's view of the biological world, in which a species that finds a previously unoccupied ecological niche (or that better exploits one that is already occupied) prospers. The entrepreneur is searching for unoccupied economic niches, opportunities to make a profit. The search is risky and usually ends in failure. But when it is successful, it can change the lives of all of us. Most large corporations are the results of entrepreneurial effort, though they may no longer be performing much of the entrepreneurial function.

2.7. Screening and Signalling

Suppose that John wants to sell a car that he values at $5000. Henry is looking for a car and would consider John's car worth $6000 if he knew as much about it as John knows. An exchange would benefit both Henry and John but it might not take place because of an information problem. John probably knows a variety of things about his car that might not be obvious to a buyer. But how can Henry trust John to tell him all that he knows when John has the incentive to misrepresent the quality of the car?

Economists say that the potential transaction described above has the problem of asymmetric information, which simply means that the information available to buyers is different than the information available to sellers. They are interested in this problem because they see it in many different situations and because it may lead to a market failure, a case in which a market is economically inefficient. However, when there is unexploited value, buyers and sellers have an incentive to find ways to capture that value. Sellers with high quality products need ways to signal the quality of their products so that buyers can distinguish between high-quality and low-quality products.

Buyers must find ways to screen out erroneous information but allow in truthful information. These problems do not exist in markets in which products are simple and easily evaluated. There is little need for this behavior in many agricultural markets, for instance.

One way a seller can signal the quality of its product is by offering guarantees or warranties. If a firm offers a warranty on a poor product, it will suffer a loss. Therefore, it is in the firm's interests to only offer a warranty on a quality product. The warranty tells potential buyers that the firm will stake money on its belief that it has a good-quality product. Another way a firm can signal quality is by building a brand name. A brand name is valuable only if consumers associate it with quality, and the firm can build this association only with time and resources. Once a brand name is established, it is in the interests of the firm to protect it by not offering a poor-quality product with its brand name. When a firm with an established brand name does offer a poor-quality product, it usually puts a different name on the product so as not to endanger the public's perception of its brand name.

Signalling plays an important role in the labor market. An employer has little information about a prospective employee, and cannot expect truthful answers if he asks whether the applicant is intelligent, has leadership qualities, and is responsible. Instead the applicant must try to prove that he has these qualities. A college education is a way of signalling intelligence and perseverance. Leadership can be signalled by extracurricular activities. (As a result, some students seek leadership positions primarily for their value as ways to signal leadership to future employers.) The purpose of a resume is to list those activities that will signal attractive qualities to potential employers.

The fact that a college education can signal qualities to employers has raised some interesting questions about why people get college educations. A popular answer among economists has been that education builds human capital, that is, it is a way of investing in people to increase their productivity. More recently some economists have suggested that this view is wrong or at best only partly true, and that college education mostly serves as a way of signalling to future employers. If education is merely a way of signalling, if it is only a complex gauntlet that eliminates those who are not intelligent and

do not have perseverance, then the social usefulness of college education may not be very great. From the viewpoint of the student, it does not matter--the benefits are the same either way. Although most economists believe that education both builds human capital and acts as a signal, the relative importance of these two functions is still disputed.

2.8. N-M INDEX

Von Neumann–Morgenstern utility function, an extension of the theory of consumer preferences that incorporates a theory of behaviour toward risk variance. It was put forth by John von Neumann and Oskar Morgenstern in *Theory of Games and Economic Behavior* (1944) and arises from the expected utility hypothesis. It shows that when a consumer is faced with a choice of items or outcomes subject to various levels of chance, the optimal decision will be the one that maximizes the expected value of the utility (i.e., satisfaction) derived from the choice made. Expected value is the sum of the products of the various utilities and their associated probabilities. The consumer is expected to be able to rank the items or outcomes in terms of preference, but the expected value will be conditioned by their probability of occurrence.

The von Neumann–Morgenstern utility function can be used to explain risk-averse, risk-neutral, and risk-loving behaviour. For example, a firm might, in one year, undertake a project that has particular probabilities for three possible payoffs of $10, $20, or $30; those probabilities are 20 percent, 50 percent, and 30 percent, respectively. Thus, expected payoff from the project would be $10(0.2) + $20(0.5) + $30(0.3) = $21. The following year, the firm might again undertake the same project, but in this example, the respective probabilities for the payoffs change to 25, 40, and 35 percent. It is easy to verify that the expected payoff is still $21. In other words, mathematically speaking, nothing has changed. It is also true that the probabilities of the lowest and highest payoffs rose at the expense of the middle one, which means there is more variance (or risk) associated with the possible payoffs. The question to pose to the firm is whether it will adjust its utility derived from the project despite the project's having the same expected value from one year to the next. If the firm values both iterations of the project equally, it is said

to be risk neutral. The implication is that it equally values a guaranteed payoff of $21 with any set of probabilistic payoffs whose expected value is also $21.

If the firm prefers the first year's project environment to the second, it places higher value on less variability in payoffs. In that regard, by preferring more certainty, the firm is said to be risk averse. Finally, if the firm actually prefers the increase in variability, it is said to be risk loving. In a gambling context, a risk averter puts higher utility on the expected value of the gamble than on taking the gamble itself. Conversely, a risk lover prefers to take the gamble rather than settle for a payoff equal to the expected value of that gamble. The implication of the expected utility hypothesis, therefore, is that consumers and firms seek to maximize the expectation of utility rather than monetary values alone. Since utility functions are subjective, different firms and people can approach any given risky event with quite different valuations. For example, a corporation's board of directors might be more risk loving than its shareholders and, therefore, would evaluate the choice of corporate transactions and investments quite differently even when all monetary values are known by all parties.

Preferences may also be affected by the status of an item. There is, for example, a difference between something possessed (i.e., with certainty) and something sought out (i.e., subject to uncertainty); thus, a seller may overvalue the item being sold relative to the item's potential buyer. This endowment effect, first noted by Richard Thaler, is also predicted by the prospect theory of Daniel Kahneman and Amos Tversky. It helps explain risk aversion in the sense that the disutility of risking the loss of $1 is higher than the utility of winning $1. A classic example of this risk aversion comes from the famous St. Petersburg Paradox, in which a bet has an exponentially increasing payoff—for example, with a 50 percent chance to win $1, a 25 percent chance to win $2, a 12.5 percent chance to win $4, and so on. The expected value of this gamble is infinitely large. It could be expected, however, that no sensible person would pay a very large sum for the privilege of taking the gamble. The fact that the amount (if any) that a person would pay would obviously be very small relative to the expected payoff shows that individuals

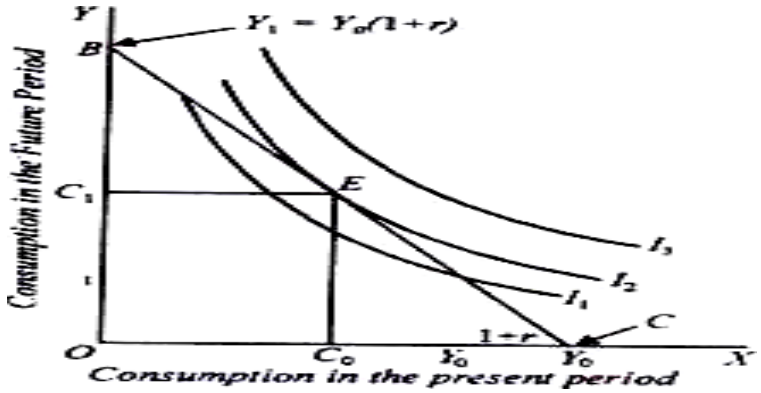
do account for risk and evaluate the utility derived from accepting or rejecting it. Risk loving may also be explained in terms of status. Individuals may be more apt to take a risk if they see no other way to improve a given situation. For example, patients risking their lives with experimental drugs demonstrate a choice in which the risk is perceived as commensurate with the gravity of their illnesses. The von Neumann–Morgenstern utility function adds the dimension of risk assessment to the valuation of goods, services, and outcomes. As such, utility maximization is necessarily more subjective than when choices are subject to certainty.

2.9. INTER - TEMPORAL CHOICE

Capital formation in a year depends on savings of the people. Now the savings of the people are determined by choice between present consumption and future consumption. The indifference curve analysis can be used to show how an individual will choose between present and future consumption so as to maximise his total satisfaction over time. To make our analysis simple (we consider only two time periods, working period and the retirement period).

In real life there are more than two time periods over which consumption and saving decisions are made by an individual but the two period models provides us useful insights into the basic issues involved. As mentioned above, the exchange of present consumption for future consumption is done through saving and lending these savings to others or keeping them in bank deposits which yield interest. In our analysis we denote present period income by Y_0, future period income by Y_1 current consumption by C_0, future consumption by C_1 and rate of interest by i. Given his present income Y_0 and rate of interest (r), an individual has to decide how much he will consume in the present (i.e., C_0) and how much he will save for consumption in the future (i.e. C_1).

The consumer's preferences between the present consumption and future consumption are represented by a set of indifference curves such as I_1I_2 which are downward-sloping and convex to the origin as shown in Figure 15.1.



Choice between present and Future consumption:

Life Saving Model

The downward sloping feature of indifference curves implies that the individual is willing to substitute some amount of present consumption for future consumption and the rate at which he is willing to substitute present consumption for future consumption depends on the particular pattern of consumption he likes to have. The convexity of indifference curves implies that the individual would like to have some 'average' amount of consumption in each period rather than extremely large consumption in the present and no or little consumption in the future or vice versa.

The Budget Constraint:

To understand the choice, it is important to know the nature of budget constraint an individual faces in this regard. There are two possible kinds of consumption choices. First, he consumes his entire income in present period, that is, he consumes Y_0 in the present period and saves nothing for the future (i.e. next period). The second possibility is that he chooses to consume less than his present income and saves some for future consumption. That is, some present consumption is exchanged for more consumption in the future. How much more future consumption he will have for sacrifice of some consumption in the present depends on the rate of interest.

Thus, if market real rate of interest is 10 per cent, then if he saves Rs 100 in the present year, he will have Rs 110 in the next year (110 = 100 + 1 0% of

100). In other words, he has exchanged Rs 100 of the present consumption for consumption of Rs 110 in the next year.

We now derive the budget constraint or what is called inter temporal budget line which has been shown by BC in Figure 15.1. We denote the individual's income in the present period by Y_0 and the next period's income by Y_1. In order to draw the inter temporal budget constraint we have to determine what would be the future income if the individual saves all his present income equal to Y_0 . Given the interest rate equal to r, the next period's income will be $Y_1 = Y_0 (1 + r)$. We represent it by point B.

Thus, if the individual decides to save his entire present income Y_0 for future consumption, then his next period's consumption which we denote by Y_1 will be $Y_1 = Y_0 (1 + r)$

We represent Y_1 by point B on the vertical axis in Fig. 15.1. If we join B with C we get the inter temporal budget line BC representing the budget constraint. The slope of the budget constraint line BC = – (1+r). Thus the slope of the budget line depends on the rate of interest which is equal to – (1 + r) where r is the market rate of interest. It may be noted that rate of interest is in fact the return on saving.

Inter temporal Choice; Individual's Equilibrium:

The pattern of individual's indifference curves depicts his preferences of present consumption over future consumption. In fact present consumption and future consumption can be regarded as two different goods.

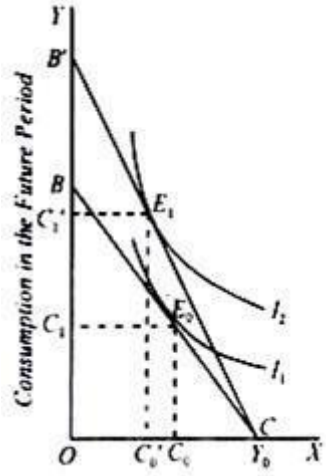
The slope of the indifference curve, that is, $\Delta C_1/\Delta C_0$ measures the marginal rate of substitution (MRS) between present consumption and future consumption and reflects his rate of time preference between the present and future consumption. On the other hand, as explained above, the slope of the budget line is given by – (1 + r) where r is rate of interest.

In his choice between present and future consumption, the consumer will try to maximise his satisfaction. But, as in consumer theory, the individual will be maximising his satisfaction where the given budget line BC is tangent to an indifference curve. It will be seen from Figure 15.1 that the individual is in equilibrium at point E on the indifference curve I_2.

Thus the consumer's optimal equilibrium position is point E on indifference curve I_2 where his present consumption is C_0 and future consumption is C_1. With his equilibrium position at E present his consumption C_0 is less than his present income Y_0.

That is, he is saving $Y_0 - C_0$ of his present income for consumption in the next period. He will lend this saving and earn interest on it so that his consumption in the next period is C_1. Thus, the individual saves a part of his income in the present period and lends it to others to earn interest. It may be noted that at the equilibrium point E, the slope of indifference curve of the individual depicting his marginal rate of substitution between present consumption and future consumption (MRS_{C0C1}) is equal to the slope of the inter temporal budget line BC which in absolute terms is equal to (1 + r). Thus, at equilibrium or optimal point E, $MRS_{C0C1} = (1 + r)$

Saving and Interest Rate:



Impact of rise in interest rate on saving

It is useful to know what will be the impact of change in the rate of interest on individual's inter temporal choice or on his savings. This is depicted in Fig. 15.2. With the equilibrium position at E_0, suppose rate of interest rises. The rise in rate of interest will change the budget constraint. With a higher interest rate than the previous one, the new budget line B'C will be steeper than the previous budget line BC. But it will be seen from Fig. 15.2 the new budget line B'C representing higher rate of interest is steeper than the previous budget line BC.

With this new budget line B'C the individual is in equilibrium at point E_1 on his higher inter temporal indifference curve I_2 and is therefore better off than before. Besides, it will be noticed that with the new position E_1 of inter temporal choice on indifference curve I_2, the individual's present consumption has decreased from C_0 to C_0', that is, he has saved more at the higher rate of interest to increase his consumption in the future period by C_1C_1.

The effect of rise in interest rate has income effect as well as substitution effect:

A rise in rate of interest increases income of the individual and therefore makes him better off. This induces him to consume more in the present. This is the income effect which tends to reduce savings. But the rise in interest rate also increases return on savings.

This induces him to postpone consumption because every sacrifice of consumption (i.e. savings) will mean more consumption in the next period due to higher interest earned. This is substitution effect which tends to increase savings. Thus the substitution effect and income effect of rise in interest rate work in opposite direction. Therefore, net effect of rise in interest rate on saving is quite uncertain.

Either of the two effects may dominate. As a result, higher interest rate may cause more or less savings. In Figure 15.3 we have shown the case when income effect dominates and therefore higher interest results in lower savings. However, empirical evidence in the US shows that substitution effect slightly out weights the income effect. As a result, there is a small net positive effect of higher interest rate on savings.

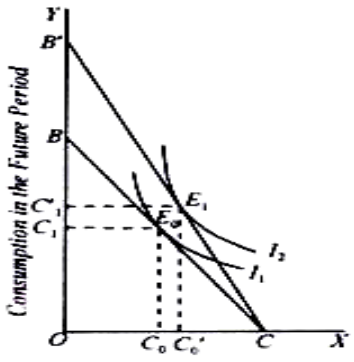


Fig. 15.3. *Impact of Rise in Interest Rate on Saving : Income Effect Dominates.*

Supply Curve of Saving:

As seen above, in Figure 15.2, a rise in the rate of interest induces the individual to save more. In this way, we can determine the saving of an individual at different rates of interest. The higher the rate of interest, the greater is the supply of saving by him.

By summing up the saving of various individuals at various rates of interest we can obtain market supply curve of savings, which will slope upward showing positive relationship between rate of interest and savings. It may be noted that in case of some individuals who have a target of having a certain fixed level of income or consumption in future, a higher rate of interest will enable them to earn that fixed income by saving and lending less in this year. That is, for these individuals supply curve of saving will be backward sloping. However, those individuals who save and lend more at higher rates of interest predominate and therefore the overall supply curve of savings slopes upward, though at very high rates of interest backward-bending shape of the supply curve of saving cannot be ruled out. However, empirical evidence shows that a rise in interest rate has only a small positive effect on the rate of saving. Therefore, the elasticity of supply curve of saving as shown in Figure 15.4 is quite small.

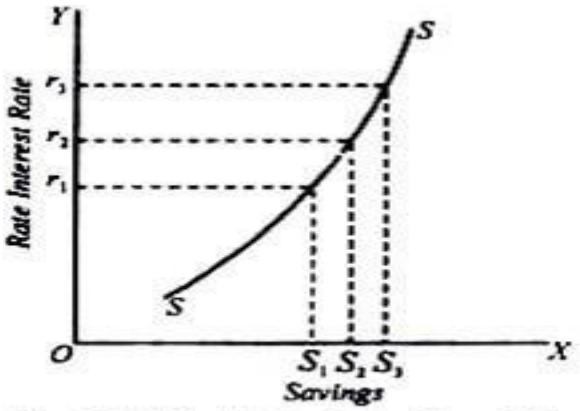


Fig. 15.4. *Positively-sloping Supply Curve of Saving*

Factors Affecting Savings:

We have seen above that people save during working years so that they can consume enough in the years of retirement. And interest rate affects the

saving for retirement. In addition to interest rate there are other factors that affect savings.We Explain below all these 'factors:

1. Interest Rate:

We have explained above that interest rate is one factor that determines supply of savings in the economy. The rise in interest rate generally brings about increase in supply of savings, though this effect is not significant.

This is because rise in interest rate gives rise to two effects- income effect and substitution effect – which work in opposite direction. While income effect of rise in wage rate tends to reduce savings and its substitution effect tends to increase it. Since substitution effect generally dominates there is a net positive effect, though a small one, of rise in interest rate on supply of savings.

2. Income:

Keynes emphasised that its level of disposable income that determines savings. As the income rises, both consumption and saving increase. However, according to Keynes, average propensity to consume declines as income increases and therefore saving rate rises at higher levels of income.

3. Social Security Provisions:

Social security measures adopted by the government such as state pension, free health care lower savings. Generous pension scheme reduces the need for saving for the retirement years. Similarly, the provision of free health care through the National Health Service also reduces the need for savings to meet the medical expenses. It has been pointed by some economists that low saving rate of the UK and USA is mainly due to the comprehensive social security system in these countries.

4. Taxation System:

Taxes also affect savings by individuals. In India and other countries income tax is the main direct tax levied on individuals' incomes including interest and dividend income. It has been pointed that income tax discourages saving.

For people who keep their savings in bank deposits or use them for buying bonds and shares, tax on interest and dividends reduce after-tax return from them."The tax on interest income substantially reduces the future payoff from current saving and as a result reduces the incentives for people to save".

According to N.G Mankiw, “Low rate of saving in the United States is at least partly attributable to tax laws that discourage savings”.

Aggregate Savings:

Savings of all individuals in a society constitute aggregate savings of the economy. At any time, some individuals who are in working life save and others who are old and leading a retired life dis-save. The retired people withdraw money from their bank accounts and/or sell shares and bonds to supplement income from their pension and other social security schemes.

In determination of aggregate savings, demographic factors also play a role. A more slowly growing population has a proportionately larger population of old and retired people and this depresses aggregate saving rate of the economy.

Bequest Motive:

An important factor that determines saving of a society is bequest motive. In order to leave behind a good amount of wealth for their children some rich people save during their life.

If high inheritance taxes are levied, they would discourage saving on this account. Since bequest motive is an important reason for savings by individuals, especially the wealthy people, the lower inheritance taxes will have a large effect on increasing the saving rate of the economy.

Precautionary Motive:

The people save for the unforeseen contingencies such as illness and periods of unemployment to protect themselves against these emergencies for which there is no insurance coverage.

Purchasing Power of Assets:

The real value, that is, purchasing power of assets such as shares, bonds houses possessed by the people also influence savings of the people. If the prices of these assets rise, people feel better off than before. This induces them to consume more and therefore save less. It has been found that when prices of assets rise, people even get more loans from the banks and spend them for consumption purposes.

Check Your Progress:

Q.No	Short Questions	LOCF Mapping		
1.	Articulate the major causes of principal agent problem.	K2	CO1	PO2
2.	Choose the sources of N-M index.	K3	CO2	PO3
3.	Examine the implications for asymmetric information.	K4	CO1	PO4
4.	Determine the need for market for lemons.	K3	CO3	PO3
5.	Examine the causes of market screening.	K4	CO2	PO4
Q.No	**Long Questions**	**LOCF Mapping**		
1.	Elucidate the role of principal agent problem and its implications.	K2	CO1	PO2
2.	List out the components of moral hazard and solve the difficulties of hazard problems.	K3	CO2	PO3
3.	Recognize the importance of adverse selection through its guidelines.	K1	CO3	PO1
4.	Distinguish between insurance market and adverse selection with examples.	K4	CO3	PO2
5.	Estimate the features of market for lemons and its guidelines.	K5	CO4	PO4

UNIT – III

MARKET STRUCTURE MODELS

3.1. PERFECT COMPETITION

Perfect competition refers to a market situation where there are a large number of buyers and sellers dealing in homogenous products. Moreover, under perfect competition, there are no legal, social, or technological barriers on the entry or exit of organizations. In perfect competition, sellers and buyers are fully aware about the current market price of a product. Therefore, none of them sell or buy at a higher rate. As a result, the same price prevails in the market under perfect competition. Under perfect competition, the buyers and sellers cannot influence the market price by increasing or decreasing their purchases or output, respectively. The market price of products in perfect competition is determined by the industry. This implies that in perfect competition, the market price of products is determined by taking into account two market forces, namely market demand and market supply.

In the words of Marshall, "Both the elements of demand and supply are required for the determination of price of a commodity in the same manner as both the blades of scissors are required to cut a cloth." As discussed in the previous chapters, market demand is defined as a sum of the quantity demanded by each individual organizations in the industry.

On the other hand, market supply refers to the sum of the quantity supplied by individual organizations in the industry. In perfect competition, the price of a product is determined at a point at which the demand and supply curve intersect each other. This point is known as equilibrium point as well as the price is known as equilibrium price. In addition, at this point, the quantity demanded and supplied is called equilibrium quantity. Let us discuss price determination under perfect competition in the next sections.

Demand under Perfect Competition:

Demand refers to the quantity of a product that consumers are willing to purchase at a particular price, while other factors remain constant. A consumer demands more quantity at lower price and less quantity at higher price. Therefore, the demand varies at different prices.

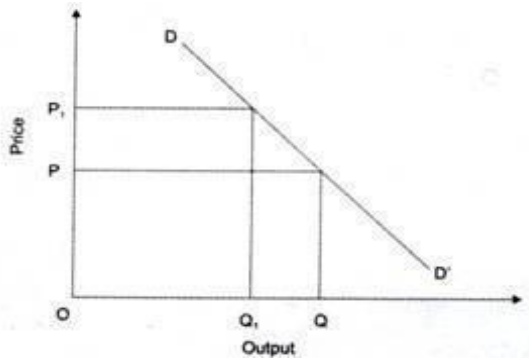


Fig3.1. Demand curve under perfect competition:

As shown in Figure-1, when price is OP, the quantity demanded is OQ. On the other hand, when price increases to OP1, the quantity demanded reduces to OQ1. Therefore, under perfect competition, the demand curve (DD') slopes downward.

Supply under Perfect Competition:

Supply refers to quantity of a product that producers are willing to supply at a particular price. Generally, the supply of a product increases at high price and decreases at low price.

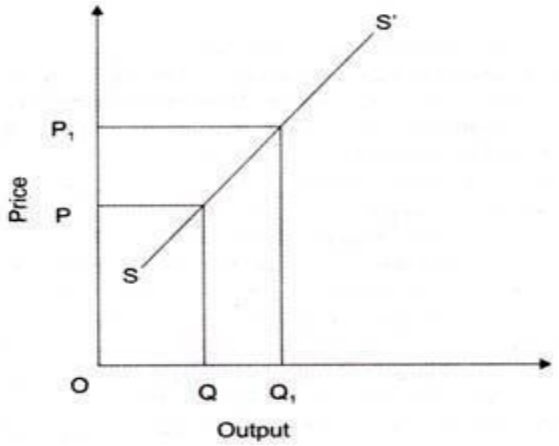


Fig.3.2. Supply curve under perfect competition

In Figure.3.2, the quantity supplied is OQ at price OP. When price increases to OP1, the quantity supplied increases to OQ1. This is because

the producers are able to earn large profits by supplying products at higher price. Therefore, under perfect competition, the supply curves (SS') slopes upward.

Equilibrium under Perfect Competition:

As discussed earlier, in perfect competition, the price of a product is determined at a point at which the demand and supply curve intersect each other. This point is known as equilibrium point. At this point, the quantity demanded and supplied is called equilibrium quantity.

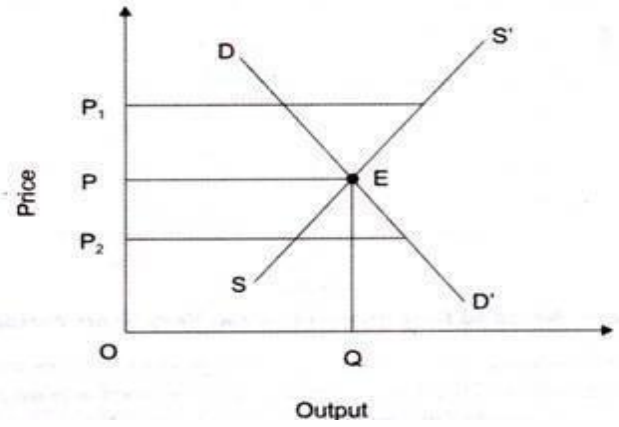


Fig.3.3 Price and output determination under perfect competition

In Fig.3.3, it can be seen that at price OP1, supply is more than the demand. Therefore, prices will fall down to OP. Similarly, at price OP2, demand is more than the supply. Similarly, in such a case, the prices will rise to OP. Thus, E is the equilibrium at which equilibrium price is OP and equilibrium quantity is OQ. The equilibrium of the firm and industry under conditions of perfect competition. It would be in the fitness of things if we first describe what we mean by perfect competition.

Perfect competition, as is generally understood, is said to prevail when the following conditions are found in the market:

1. There are a large number of firms producing and selling a product.
2. The product of all firms is homogeneous.
3. Both the sellers and buyers have perfect information about the prevailing price in the market.
4. Entry into and exit from the industry is free for the firms.

We shall discuss below in detail the above four conditions of perfect competition.

Large Number of Firms:

The first condition of perfect competition is that there are a large number of firms in the industry. The position of a single firm in the industry containing numerous firms is just like a drop in the ocean. The existence of a large number of firms producing and selling the product ensures that an individual firm exercises no influence over the price of the product.

The output of an individual firm constitutes a very small fraction of the total output of the whole industry so that any increase or decrease in output by an individual firm has a negligible effect on the total supply of product of the industry. As a result, a single firm is not in a position to influence the price of the product by the increasing or reducing its output. The individual firm under perfect competition therefore takes the price of the product as a given datum and adjusts its output to earn maximum profits. In other words, a firm under perfect competition is price-taker and output-adjuster.

Homogeneous Products:

The second condition of perfect competition is that the products produced by all firms in the industry are fully homogeneous and identical. It means that the products of various firms are indistinguishable from each other; they are perfect substitutes for one another. In other words, cross elasticity between the products of the firms is infinite. In case of homogeneous products, trademarks, patents, special brand labels etc. do not exist since these things make the products differentiated.

It should be noted that if there are many firms, but they are producing differentiated products, each one of them will have influence over the price of his own variety of the product. The control over price is completely eliminated only when all firms are producing homogeneous products. But whether or not products are homogeneous should be judged from the viewpoint of the buyers. Products would be homogeneous only when the buyers consider them to be so. Even if the buyers find some imagined differences between the products, the products would not be homogeneous, howsoever physically alike they may be.

Anything which makes buyers prefer one seller to another, be it personality, reputation, convenient location, or the tone of his shop, differentiates the product to that degree, since what is bought is really a bundle of utilities of which these things are a part. Therefore, for the products to be homogeneous utilities offered by all sellers to buyers must be identical. If the bundle of utilities offered by all sellers is not the same, then the buyers would have a preference for some sellers who will have a degree of control over their individual prices.

Thus the existence of homogeneous products signifies that the products of all sellers are completely identical in the eyes of consumers who therefore do not have any preference for one seller over another under such conditions it is evident that "buyers and sellers will be paired in random fashion in a large number of transactions. It will be entirely a matter of chance from which seller a particular buyer makes his purchases, and purchases over a period of time will be distributed among all sellers according to the law of probability. After all this is only another way of saying that the product is homogeneous."

Perfect Information about the Prevailing Price:

Another condition for perfect competition to prevail is that both the buyers and sellers are fully aware of the ruling price in the market. Because only when all buyers know fully the current price of the product in the market, sellers cannot charge more than the prevailing price.

If any seller tries to charge a higher price than that ruling in the market, then the buyers will shift to some other sellers and buy the good at the ruling price since they know what the ruling price in the market is. Similarly, all sellers are also aware of the prevailing price in the market and no one will charge less price than this.

Free Entry and Exit:

Lastly, perfect competition requires that there must be complete freedom for the entry of new firms or the exit of the existing firms from the industry in the long run. There must be no barriers to the entry of firms. Since, in the short run, firms can neither change the size of their plants, nor new firms can enter or old ones can leave the industry, the condition of free

entry and free exit therefore applies only to the long-run equilibrium under perfect competition.

If the existing firms are making super-normal profits in the short run, then this condition requires that in the long run new firms will enter the industry to compete away the profits. If, on the other hand, firms are making losses in the short run, some of the existing firms will leave the industry in the long run with the result that the price of the product will go up and the firms left in the industry will be earning at least normal profits.

The Demand Curve of a Product Facing a Perfectly Competitive Firm:

The first three conditions ensure that a single price must prevail under perfect competition and he demand curve or average revenue curve faced by an individual firm under perfect competition is perfectly elastic at the ruling price in the market. Perfectly elastic demand curve signifies that the firm does not exercise any control over the price of the product but can sell any amount of the product as it likes at the ruling price. If the firm raises its price slightly above the ruling price, it will lose all its customers to its rivals. Because it can sell as much as it likes at the prevailing price it has no incentive to lower it. Without being able to raise the price and having no incentive to lower it, the firm is content it to accept the ruling price in the market. Once the price in the market is established, a firm accepts as a given datum and adjusts its output at the level which gives it maximum profits.

Consider Fig. 3.4. To begin with, demand curve DD and supply curve SS intersect at point E and determine price OP. Now, the firm, having no influence over the price, will take the price OP as given and therefore average-marginal revenue curve facing it will be a horizontal straight line at the level of OP. When the demand increases and as a result the price rises to OP', the firm will now confront average-marginal revenue curve at the level of OP'. And if the demand decreases and price falls to OP" the firm's average-marginal revenue curve will shift below to the level of OP"

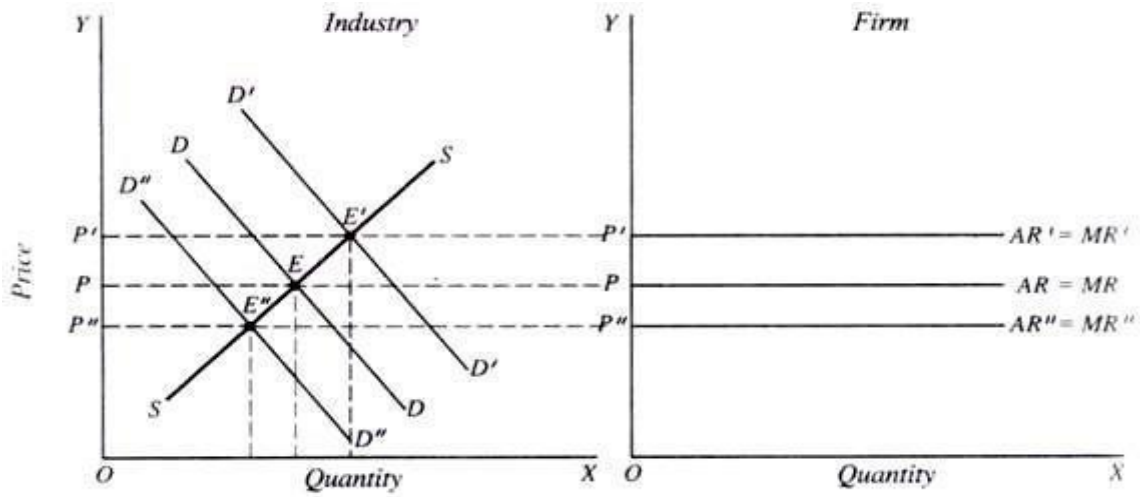


Fig.3.4 Demand curve facing an individual firm

The fourth condition, namely, free entry and free exit, ensures that the firm will make only normal profits in the long run. On the one hand, super-normal profits will disappear by the entry of new firms in the industry and, on the other, losses will disappear as a result of some firms leaving the industry.

3.2 Monopoly:

The word monopoly has been derived from the combination of two words i.e., 'Mono' and 'Poly'. Mono refers to a single and poly to control. In this way, monopoly refers to a market situation in which there is only one seller of a commodity. There are no close substitutes for the commodity it produces and there are barriers to entry. The single producer may be in the form of individual owner or a single partnership or a joint stock company. In other words, under monopoly there is no difference between firm and industry. Monopolist has full control over the supply of commodity. Having control over the supply of the commodity he possesses the market power to set the price. Thus, as a single seller, monopolist may be a king without a crown. If there is to be monopoly, the cross elasticity of demand between the product of the monopolist and the product of any other seller must be very small.

Definitions:

"Pure monopoly is represented by a market situation in which there is a single seller of a product for which there are no substitutes; this single

seller is unaffected by and does not affect the prices and outputs of other products sold in the economy." Bilas

"Monopoly is a market situation in which there is a single seller. There are no close substitutes of the commodity it produces, there are barriers to entry". -Koutsoyiannis

"Under pure monopoly there is a single seller in the market. The monopolist demand is market demand. The monopolist is a price-maker. Pure monopoly suggests no substitute situation". -A. J. Braff

"A pure monopoly exists when there is only one producer in the market. There are no dire competitions." -Ferguson

"Pure or absolute monopoly exists when a single firm is the sole producer for a product for which there are no close substitutes." -McConnel

Features:

We may state the features of monopoly as:

1. One Seller and Large Number of Buyers:

The monopolist's firm is the only firm; it is an industry. But the number of buyers is assumed to be large.

2. No Close Substitutes:

There shall not be any close substitutes for the product sold by the monopolist. The cross elasticity of demand between the product of the monopolist and others must be negligible or zero.

3. Difficulty of Entry of New Firms:

There are either natural or artificial restrictions on the entry of firms into the industry, even when the firm is making abnormal profits.

4. Monopoly is also an Industry:

Under monopoly there is only one firm which constitutes the industry. Difference between firm and industry comes to an end.

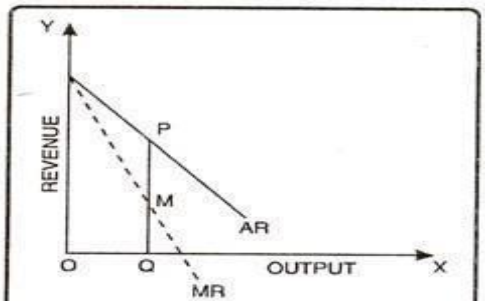
5. Price Maker:

Under monopoly, monopolist has full control over the supply of the commodity. But due to large number of buyers, demand of any one buyer constitutes an infinitely small part of the total demand. Therefore, buyers have to pay the price fixed by the monopolist.

Nature of Demand and Revenue under Monopoly:

Under monopoly, it becomes essential to understand the nature of demand curve facing a monopolist. In a monopoly situation, there is no difference between firm and industry. Therefore, under monopoly, firm's demand curve constitutes the industry's demand curve. Since the demand curve of the consumer slopes downward from left to right, the monopolist faces a downward sloping demand curve. It means, if the monopolist reduces the price of the product, demand of that product will increase and vice- versa.

In Fig. 3.5 average revenue curve of the monopolist slopes downward from



(Fig.3.5).

left to right. Marginal revenue (MR) also falls and slopes downward from left to right. MR curve is below AR curve showing that at OQ output, average revenue (= Price) is PQ whereas marginal revenue is MQ. That way AR > MR or PQ > MQ.

Costs under Monopoly:

Under monopoly, shape of cost curves is similar to the one under perfect competition. Fixed costs curve is parallel to OX-axis whereas average fixed cost is rectangular hyperbola. Moreover, average variable cost, marginal cost and average cost curves are of U-shape. Under monopoly, marginal cost curve is not the supply curve. Price is higher than marginal cost. Here, it is of immense use to quote that a monopolist is not obliged to sell a given amount of a commodity at a given price.

Monopoly Equilibrium and Laws of Costs:

The decision regarding the determination of equilibrium price in the long run depends on the elasticity of demand and effect of law of costs on monopoly price determination.

1. Nature of Elasticity of Demand:

If the demand is inelastic, the monopolist will fix high price of his product. Inelastic demand refers to the situation in which consumers must have to buy the commodity what-so-ever may be the price. On the other hand, if demand is elastic, the monopolist will fix low price per unit.

2. Effects of Laws of Costs:

The monopolist also takes into consideration laws of costs while determining the prices. In the long run, output may be produced under law of diminishing costs, increasing costs and constant costs. A brief description of these laws has been given as under:

Increasing Costs:

If the monopolist produces the commodity under the law of Diminishing Returns or Increasing costs, he will get the maximum profit at point E where marginal revenue is equal to marginal cost. This is indicated in Fig. 3.5. Here he produces OM units of the commodity and gets PM as the price. His monopoly profit is represented by the shaded area PQRS. No other alternative will give him this much of profit and hence this is the best position for him provided he produces goods under the Law of Increasing Costs.

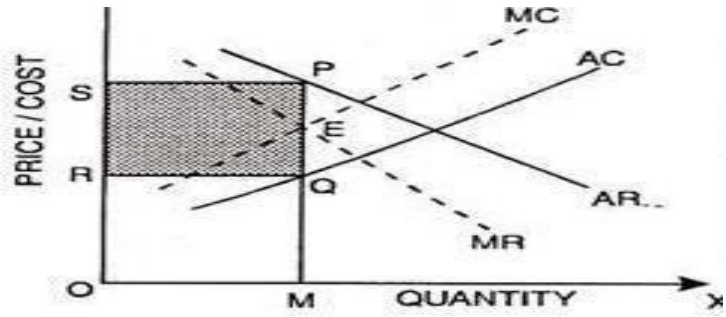


Fig.3.5. Increasing cost

Diminishing Costs

The same approach will be applicable under the Law of Increasing Returns or Diminishing Cost as explained in Fig. 3.6. Here AC and MC are falling. The MC and MR are equal at point E. accordingly; the monopolist will produce OM units of commodity and sell the same at PM Price. His net monopoly revenue will be PQRS indicated by shaded area.

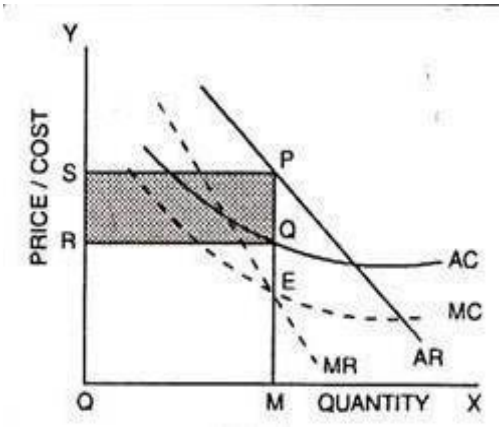
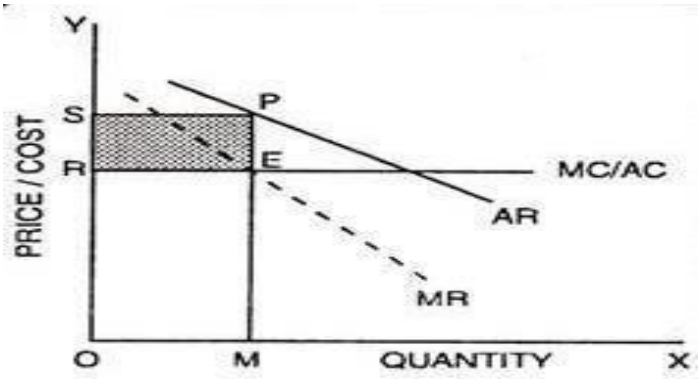


Fig.3.6. Diminishing cost

Constant Costs:

The determination of monopoly price under constant costs can be shown with the help of Fig. 9. In the diagram, the AC curve will be a horizontal line running parallel to OX and for all the levels of output AC will be equal to MC. AR and MR represent the average revenue curve and marginal revenue curve respectively. The equilibrium between MC and MR is



3.7. Constant cost

brought at point E when the output is OM. Thus, the monopolist will produce OM and will sell it at PM Price. The monopoly profit will, therefore, be equal to PERS which is represented by the shaded area.

3.2.1 Equilibrium of the Monopolist: Short-Run and Long-Run Equilibrium

A. Short-run equilibrium:

The monopolist maximizes his short-run profits if the following two conditions are fulfilled,

a) Firstly, the MC is equal to the MR.

b) Secondly, the slope of MC is greater than the slope of the MR

at the point of intersection.

In figure 3.8 the equilibrium of the monopolist is defined by point ε, at which the MC intersects the MR curve from below. Thus both conditions for equilibrium are fulfilled. Price is P_M and the quantity is X_M. The monopolist realizes excess profits equal to the shaded area AP_M CB. Note that the price is higher than the MR.

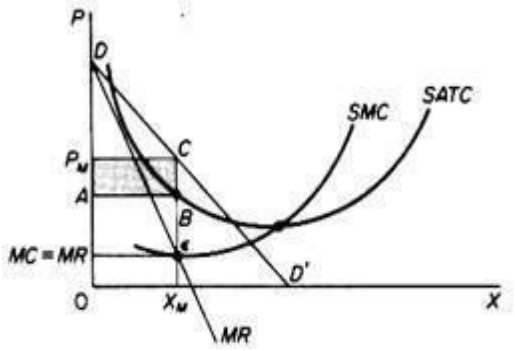


Figure 3.8

In pure competition the firm is a price-taker, so that its only decision is output determination. The monopolist is faced by two decisions: setting his price and his output. However, given the downward-sloping demand curve, the two decisions are interdependent. The monopolist will either set his price or sell the amount that the market will take at it, or he will produce the output defined by the intersection of MC and MR, which will be sold at the corresponding price, P. The monopolist cannot decide independently both the quantity and the price at which he wants to sell it. The crucial condition for the maximization of the monopolist's profit is the equality of his MC and the MR, provided that the MC cuts the MR from below.

We may now re-examine the statement that there is no unique supply curve for the monopolist derived from his MC. Given his MC, the same quantity may be offered at different prices depending on the price elasticity of demand. Graphically this is shown in figure 3.9. The quantity X will be sold at price P_1 if demand is D_1, while the same quantity X will be sold at price P_2 if demand is D_2.

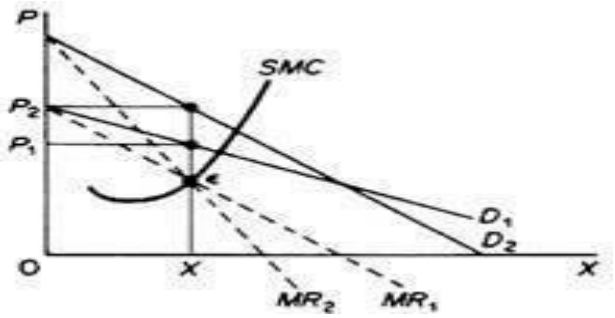


Figure 3.9

Thus there is no unique relationship between price and quantity. Similarly, given the MC of the monopolist, various quantities may be supplied at any one price, depending on the market demand and the corresponding MR curve. In figure 3.10 we depict such a situation. The cost conditions are represented by the MC curve. Given the costs of the monopolist, he would supply $0X_1$, if the market demand is D_1, while at the same price, P, he would supply only $0X_2$ if the market demand is D_2.

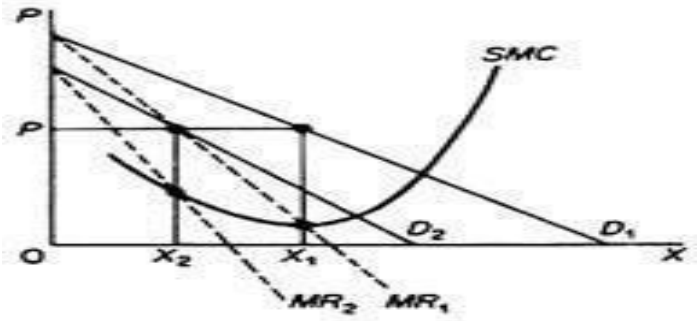


Figure 3.10.

B. Long-run Equilibrium:

In the long run the monopolist has the time to expand his plant, or to use his existing plant at any level which will maximize his profit. With entry blocked, however, it is not necessary for the monopolist to reach an optimal scale (that is, to build up his plant until he reaches the minimum point of the LAC). Neither is there any guarantee that he will use his existing plant at optimum capacity. What is certain is that the monopolist will not stay in business if he makes losses in the long run.

He will most probably continue to earn supernormal profits even in the long run, given that entry is barred. However, the size of his plant and the degree of utilization of any given plant size depend entirely on the market demand. He may reach the optimal scale (minimum point of LAC) or remain

at suboptimal scale (falling part of his LAC) or surpass the optimal scale (expand beyond the minimum LAC) depending on the market conditions. In figure 3.11 we depict the case in which the market size does not permit the monopolist to expand to the minimum point of LAC. In this case not only is his plant of suboptimal size (in the sense that the full economies of scale are not exhausted) but also the existing plant is underutilized. This is because to the left of the minimum point of the LAC the SRAC is tangent to the LAC at its falling part, and also because the short-run MC must be equal to the LRMC. This occurs at e, while the minimum LAC is at b and the optimal use of the existing plant is at a. Since it is utilized at the level e', there is excess capacity.

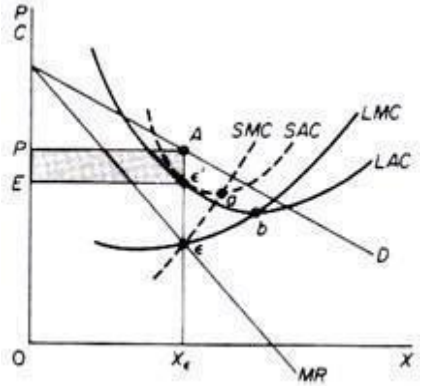


Fig.3.11.Monopolist will suboptimal plant and excess capacity

In figure 3.12 we depict the case where the size of the market is so large that the monopolist, in order to maximize his output, must build a plant larger than the optimal and over utilise it. This is because to the right of the minimum point of the LAC the SRAC and the LAC are tangent at a point of their positive slope, and also because the SRMC must be equal to the LAC. Thus the plant that maximizes the monopolist's profits leads to higher costs for two reasons firstly because it is larger than the optimal size, and secondly because it is over utilised.

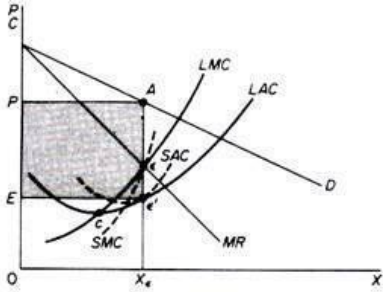


Fig.3.12

Finally in figure 3.13 we show the case in which the market size is just large enough to permit the monopolist to build the optimal plant and use it at full capacity.

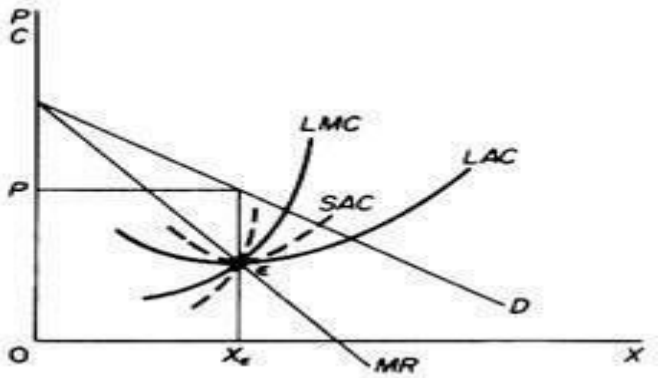


Fig.3.13.

It should be clear that which of the above situations will emerge in any particular case depends on the size of the market (given the technology of the monopolist). There is no certainty that in the long run the monopolist will reach the optimal scale, as is the case in a purely competitive market. In monopoly there are no market forces similar to those in pure competition which lead the firms to operate at optimum plant size (and utilize it at its full capacity) in the long run.

3.3 PRICE DISCRIMINATION

3.3.1. Meaning

Price discrimination means charging different prices from different customers or for different units of the same product. In the words of Joan Robinson: "The act of selling the same article, produced under single control at different prices to different buyers is known as price discrimination." Price discrimination is possible when the monopolist sells in different markets in such a way that it is not possible to transfer any unit of the commodity from the cheap market to the dearer market.

Price discrimination is, however, not possible under perfect competition, even if the two markets could be kept separate. Since the market demand in each market is perfectly elastic, every seller would try to sell in that market in which he could get the highest price. Competition would make the price equal in both the markets. Thus price discrimination is possible only when markets are imperfect.

3.3.2. Types of Price Discrimination:

Firstly, it may be personal based on the income of the customer. For example, doctors and lawyers charge different fees from different customers on the basis of their incomes. Higher fees are charged to rich persons and lower to the poor.

Secondly, price discrimination may be based on the nature of the product. Paperback is cheaper than the deluxe edition of the same book, for the former is bought by the majority of readers, and the latter by libraries. Unbranded products, like open tea, are sold at lower prices than branded products like Brooke Bond or Lipton tea. Economy size tooth pastes are relatively cheaper than ordinary-sized tooth pastes. In the case of services too, such price discrimination is practised when off-season rates of hotels at hill stations are very low as compared to the peak season. Dry cleaning firms charge for two while they clean three clothes during off-season; whereas they charge more for quick service in peak reason.

Thirdly, price discrimination is also related to the age, sex and status of the customers. Barbers charge less for children's hair-cuts. Certain cinema halls admit ladies only at lower rates. Military personnel in uniform are admitted at concessional rates in all cinema houses.

Fourthly, discrimination is also based on the time of service. Cinema houses at certain places, like New Delhi, charge half the rates in the morning show than in the afternoon shows.

Fifthly, there is geographical or local discrimination when a monopolist sells in one market at a higher price than in the other market.

Lastly, discrimination may be based on the use of the product. Railways charge different rates for different compartments or for different services. Less is charged for the transportation of coal than for bales of cloth on the same route. State power boards charge low rates for industrial use than for domestic consumption of electricity.

3.3.3. Conditions for Price Discrimination:

(1) Market Imperfections:

Price discrimination is possible when there is some degree of market imperfection. The individual seller is able to divide and keep his market into

separate parts only if it is imperfect. Customers do not move readily from one market to the other because of ignorance or inertia.

(2) Agreement among Rival Sellers:

Price discrimination also takes place when the seller of a commodity is a monopolist or when rivals enter into an agreement for the sale of the product at different prices to different customers. This is usually possible in the sale of direct services. A single surgeon may charge a high fee for an operation from a rich patient and relatively low fee from a poor patient.

In place where a number of surgeons and physicians practice, they charge their fees according to the income of the patients. The rate of fee is fixed for each category of patient. Lawyers charge from their clients in proportion to the degree of risk or amount of money involved in a law suit. Price discrimination is possible in the case of services because there is no possibility of resale.

(3) Geographical or Tariff Barriers:

Discrimination may occur on geographical grounds. The monopolist may discriminate between home and foreign buyers by selling at a lower price in the foreign market than in the domestic market. This type of discrimination is known as "dumping". It can only be successful if the commodities sold abroad can be prevented from being returned to the home country by tariff restrictions.

Sometimes transport costs are so high that they act as a safeguard against the return of dumped goods. Geographical discrimination satisfies Pigou's first condition for discrimination 'when no unit of the commodity sold in one market can be transferred to another.'

(4) Differentiated Products:

Discrimination is possible when buyers need the same service in connection with differentiated products. Railways charge different rates for the transport of coal and copper. For they know that it is physically impossible for a copper merchant to convert copper into coal for the purpose of transporting it cheaper.

This satisfies Pigou's second condition that 'no unit of demand proper to one market can be transferred to another.' It also applies to discrimination based

on age, sex, status and income of buyers of services. For instance, a rich man cannot become poor for the sake of getting cheap medical facilities.

(5) Ignorance of Buyers:

Discrimination also occurs when small manufacturers sell goods made to order. They charge different rates to different buyers depending upon the intensity of their demand for the product. Shoe makers charge a high price for the same variety from those customers who want them earlier than others. For the same variety of shoes, different buyers are also charged different prices because individual buyers are not in a position to know the price being charged to others.

(6) Artificial Differences between Goods:

A monopolist may create artificial differences by presenting the same commodity in different quantities. He may present it under different names and labels, one for the rich and snobbish buyers and the other for the ordinary. Thus he may charge different prices for substantially the same product. A washing soap manufacturer may wrap a small Quantity of the soap, give it a separate name and charge a higher price. He may sell it at Rs 17 per kg. As against Rs 16 for the unwrapped soap.

(7) Differences in Demand:

For price discrimination, the demand in the separate markets must be considerably different. Different prices can be charged in separate markets based on differences of elasticity of demand. Low price is charged where demand is more elastic and high price in the market with the less elastic demand.

3.3.4. Degrees of Price Discrimination:

Prof. Pigou in his Economics of Welfare describes three degrees of discriminating power which a monopolist may wield. The type of discrimination discussed above is called discrimination of the third degree. We explain below discrimination of the first degree and the second degree.

Discrimination of the **First Degree or Perfect Discrimination:**

Discrimination of the first degree occurs when a monopolist charges "a different price against all the different units of commodity in. such wise that

the price exacted for each was equal to the demand price for it and no consumer's surplus was left to the buyers."

Joan Robinson calls it perfect discrimination when the monopolist sells each unit of the product at a separate price. Such discrimination is possible only when consumers are sold the units for which they are prepared to pay the highest price and thus they are not left with any consumer's surplus.

For perfect price discrimination, two conditions are required:

(1) To keep the buyers separate from each other, and

(2) to deal with each buyer on a take-it-or-leave-it basis. When the discriminator of first degree is able to deal with his customers on the above basis, he can transfer the whole of consumers' surplus to himself. Consider Figure 3.14. Where DD_1 is the demand curve faced by the monopolist. Each buyer is assumed as a price-taker. Suppose the discriminating monopolist sells four units of his product at four different prices:

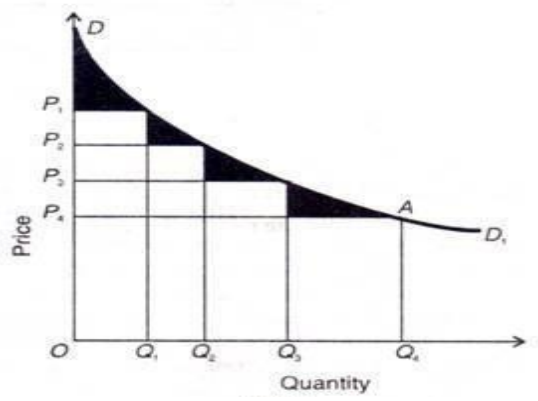


Fig.3.14

OQ_1 unit at OP_1price, Q_1Q_2 unit at OP_2 price, Q_2Q_3 unit at OP_3 price and Q_3Q_4 unit at OP_4 price. The total revenue (or price) obtained by him would be OQ_4 AD. This area is the maximum expenditure that the consumers are willing to incur to buy all four units of the product under the first-degree discriminator's all-or-nothing offer. But with no price discrimination under simple monopoly, the monopolist would sell all four units at the uniform price OP_4 and thus obtain the total revenue of OQ_4AP_4. This area represents the total expenditure that consumers would actually pay for the four units. Thus the difference between what Quantity the consumers were willing to pay (OQ_4 AD) under Fig. 3.14 the take-it-or-leave-it offer of the first degree discriminator and what they actually pay (OQ_4AP_4) to the simple monopolist,

is consumers' surplus. This is equal to the area of the triangle DAP_4. Thus under the first-degree price discrimination, the entire consumers' surplus is pocketed by the monopolist when he charges a separate price for each unit of the product. Price discrimination of the first degree is rare and is to be found in such rare products as diamonds, jewels, precious stones, etc. But a monopolist must have full knowledge of the demand curve faced by him and he should know the maximum price that the consumers are willing to pay for each unit of the product he wants to sell.

Discrimination of the Second Degree or Multi-part Pricing:

In discrimination of the second degree, the monopolist divides the consumers in different slabs or groups or blocks and charges different prices for different slabs of the same product. Since the earlier units of the product have more utility for the consumers than the later ones, the monopolist charges a higher price for the former units and reduces the price for the later units in the respective slabs.

Such discrimination is only possible if the demand of each consumer below a certain maximum price is perfectly inelastic. Electric supply companies in developed countries practice discrimination of the second degree when they charge a high rate for the first slab of kilowatts of electricity consumed. As more electricity is used, the rate falls with subsequent slabs.

Figure 3.15 illustrates the second degree discrimination, where $DD_1$is the demand curve for electricity on the part of domestic consumers in a town. CP_3 represents the cost of generating electricity, so that the electricity company charges M_1P_1 rate per Kw. Up to OM_1 units. For consuming the next M_1 to M_2 units, the rate is lowered to M_2P_2. The lowest rate charged is M_3P_3 for M_2 to M_3 units. M_3P_3 is, however, the lowest rate which will be charged even if a consumer consumes more than M_3 units of electricity.

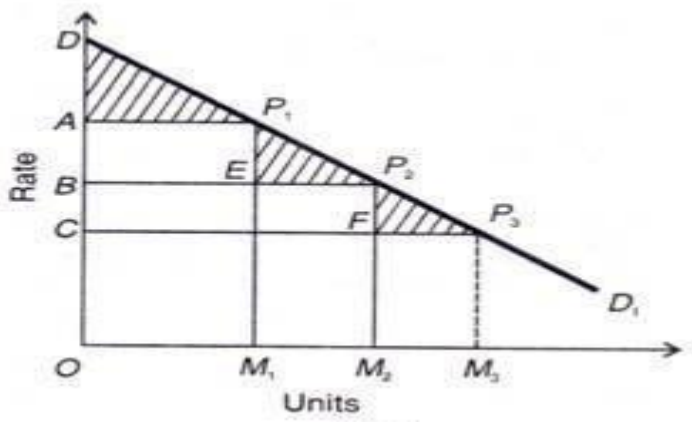


Fig.3.15

If the electricity company were to charge only one rate throughout, say $M_3P_3$the total revenue would not be maximised. It would be OCP_3 M_3 but by charging different rates for different unit slabs, it gets the total revenue equal to OM_3 x P_1M_1 + OM_2 x P_2M_2 + OM_3x P_3M_3 Thus the second degree discriminator would take away a part of consumers' surplus covered by the rectangles $ABEP_1$and $BCFP_2$ .The shaded area in three triangles DAP_1 P_1EP_2, and P_2FP_3 still remains with consumers as their surplus.

The second degree price discrimination is practised by telephone companies, railways, companies supplying water, electricity and gas in developed countries where these services are available in plenty. But it is not found in developing countries like India where such services are scarce. The differences between the first and second degree price discrimination may be noted. In the first degree discrimination, the monopolist charges a different price for each different unit of the product. But in second degree discrimination, a number of units in one slab (or group or block) are sold at the lowest price and as the slabs increase, the prices charged by the monopolist are lowered. In the case of the former the monopolist takes away the whole of consumers' surplus. But in the latter case, the monopolist takes away only a portion of the consumers' surplus and the other portion is left with the buyer.

3.4. CONTESTBLE MARKET

Baumol, Panzor and Willing have developed a new theory of markets known as the theory of contestable markets. According to this theory, even when there prevail monopoly and oligopoly in the product markets, the firms may

find it most profitable to behave in setting price of its product as if they were working in a perfectly competitive market. This is because a firm thinks that if it sets a price higher than competitive market, other firms will enter the market and compete for the customers and thereby push down the price. Hence, the threat of new entrants in the markets forces the existing firm or firms to charge no more than the competitive price and therefore make only normal profits.

Important conditions for contestable markets to prevail are:

1. The new firms can enter the market with the same cost conditions as the existing firm or firms. If the existing firm enjoys some cost advantage as compared to the potential entrants in the market, then the new firms that enter the market cannot succeed in competing with the existing one which can afford to lower the price and inflict losses on the new entrants.

2. The second condition for the contestable markets is that firms should be able to leave or exit the market (i.e. industry) without incurring any capital loss. If the production in an industry involves much capital investment which is specific to that industry and therefore of no use elsewhere, leaving the industry will entail losses equal to the sunk costs. Recall that sunk costs are the costs incurred on capital assets which are specific to an industry and cannot be recovered by selling them or which cannot be deployed or used elsewhere for commercial or production purposes. Sunk costs act as an important barrier to the entry of new firms and are therefore deterrent to the existence of contestable markets.

3. The third condition for contestable markets to exist is that the potential entrants must be at no disadvantage as compared to the existing firms with regard to the production technology or product quality as perceived by the consumers. Any lack of access to the same production technology as used by the existing firms prevents the new entrants from competing the existing firms on the basis of cost or product quality. This would work to reduce the threat by potential entrants and enable the existing firms to charge higher than competitive price and earn supernormal profits.

4. The last condition for the contestable markets to exist is that the new entrants must be able to engage in 'hit and run' tactics. That is, entry should

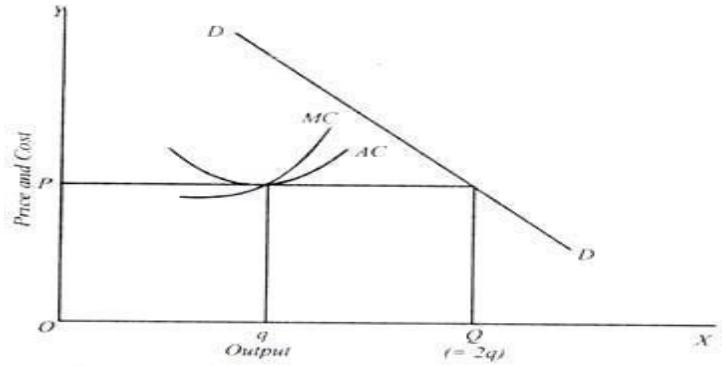


Fig.3.16 Contestable Market

be free and costless so that the new entrants enter the market or industry and make profits and exit the industry before the existing firms adjust their prices downward. Hit and run tactics can succeed when the existing firms can adjust their prices with some time – lags whereas the consumers immediately respond to buy from new entrants who offer same or similar products at slightly lower prices. It follows from above that fewer the barriers to the entry in a market, the more contestable the market is. So to the extent monopolistic and oligopolistic markets are contestable depends on the barriers to the entry of new firms into a market or industry. When there are absolutely no barriers to the entry of new firms, the perfectly contestable markets would exist even though the existing firms may be working in monopolistic or oligopolistic market structures. In perfectly contestable markets, the existing firms are forced to keep their prices equal to average cost and therefore make only normal profits.

Price setting in a contestable market is illustrated in Figure 29.9 Suppose there are two firms in an industry, that is, there is duopoly in the product market. DD is the demand curve for the industry's product. The average and marginal cost curves of each firm are shown. The threat of entry of new firms leads each duopolistic to charge a price OP (which is equal to their minimum average cost) and produces output equal to Oq. The total output OQ will be equal to two times Oq. (That is OQ = 2Oq). Each firm earns zero economic profits. Though the two firms can enter into tacit collusion and push up the price and earn supernormal profits, they do not do so because they think new entrants will enter industry quickly and undercut price and in this way inflict losses on them. To prevent entry of new firms and avoid competition with

them each duopolist produces OQ output and charges OP price. By producing at the lowest minimum average cost they are able to enjoy all the economies of scale. Thus, in producing the level of output at the minimum average cost and charging a price equal to it, the two firms behave like a perfectly competitive firm.

The theory of contestable markets has been criticised, among others by Shepherd who points out that it is based on extremely unrealistic assumptions regarding entry and exit of new firms. According to him, in the real world entry is not free and exit is not costless. He contends that most monopolistic and oligopolistic markets are not contestable because there exist a good amount of sunk costs in most of the industries. These sunk costs act a barrier to the entry of potential entrants as they cannot exit the market without much loss. Because some of the investment involves sunk cost, the new competitors would have to set a price high enough to cover all their costs, whereas the existing firm could set a slightly lower price and make more than normal profits.

To conclude, the threat of new entrants can lead to the existing monopolists and oligopolists to behave like a competitive firm in some situations but when there exist substantial sunk investment costs, the existing firms have an edge over the new entrants and charge higher than competitive price and make large supernormal profits. We thus see that contestable market theory does not apply to all monopolistic and oligopolistic market situations.

3.5. MONOPOLISTIC COMPETITION

The concept of excess capacity is found in the earlier works of Wicksell and Cairnes. P. Sraffa and Mrs. Joan Robinson also outlined it. But it was Chamberlin who expounded it in a most systematic manner followed by Kaldor, Kahn, Harrod and Cassels. The doctrine of excess (or unutilised) capacity is associated with monopolistic competition in the long- run and is

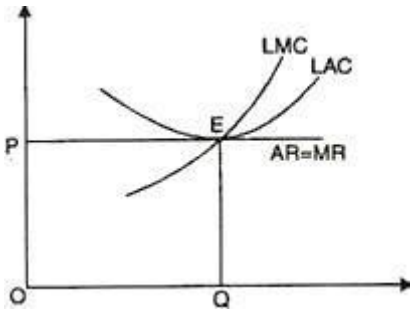


Fig.3.17

defined as "the difference between ideal (optimum) output and the output actually attained in the long-run." Under perfect competition, however, the demand curve (AR) is tangential to the long-run average cost curve (LAC) at its minimum point and conditions of full equilibrium are fulfilled: LMC = MR and AR (price) = Minimum LAC. This means that in the long-run the entry of new firms forces the existing firms to make the best use of their resources to produce at the point of lowest average total costs. At point E in Figure 3.17, abnormal profits will be competed away because MR = LMC = AR = LAC at its minimum point E and OQ will be the most efficient output which the society will be enjoying. This is the ideal or optimum output which firms produce in the long-run. Under monopolistic competition the demand curve facing the individual firm is not horizontal as under perfect competition, but it is downward sloping. A downward sloping demand curve cannot be tangent to the LAC curve at its minimum point.

The double condition of equilibrium LMC = MR = AR (d) = Minimum LAC will not be fulfilled. The firms will, therefore, be of less than the optimum size even when they are earning normal profits. No firm will have the incentive to produce the ideal output, since any effort to produce more than the equilibrium output would involve a higher long-run marginal cost than marginal revenue. Thus each firm under monopolistic competition will be of less than the optimum size and work under excess capacity. This is illustrated in Figure 3.18 where the monopolistic competitive firm's demand curve is d and MR_1 is its corresponding marginal revenue curve. LAC and LMC are the long-run average cost and marginal cost curves.

The firm is in equilibrium at E_1 where the LMC curve cuts the MR_1 curve from below and OQ_1 output is set at the price Q_1A_1. OQ_1 is the equilibrium output

but not the ideal output because d is tangent to the LAC curve at A_1 to the left of the minimum point E. Any effort on the part of the firm to produce beyond OQ_1 will mean losses as beyond the equilibrium point E_1, LMC > MR_1. Thus the firm has negative excess capacity measured by OQ_1 which it cannot utilize working under monopolistic competition. A comparison of the equilibrium positions under monopolistic competition and perfect competition with the help of Figure 3.18 reveals that the output of a firm under monopolistic competition is smaller and the price of its product is higher than under perfect competition. The monopolistic competition output OQ_1 is less than the perfectly competitive output OQ, and the monopolistic competitive price Q_1A_1 is higher than the competitive equilibrium price QE. This is because of the existence of excess capacity under monopolistic competition.

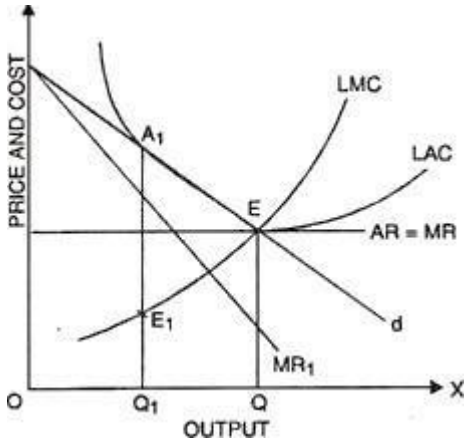


Fig.3.18.

Chamberlin's Concept of Excess Capacity:

Prof. Chamberlin's explanation of the theory of excess capacity is different from that of ideal output under perfect competition. Under perfect competition, each firm produces at the minimum on its LAC curve and its horizontal demand curve is tangent to it at that point. Its output is ideal and there is no excess capacity in the long-run. Since under monopolistic competition the demand curve of the firm is downward sloping due to product differentiation, the long-run equilibrium of the firm is to the left of the minimum point on the LAC curve. According to Chamberlin, so long as there is freedom of entry and price competition in the product group under monopolistic competition, the tangency point between the firm's demand

curve and the LAC curve would lead to the "ideal output" and no excess capacity.

Assumptions:

Chamberlin's concept of excess capacity assumes that:

(i) The number of firms is large;

(ii) Each produces a similar product independently of the others;

(iii) It can charge a lower price and attract other's customers and by raising its price will lose some of its customers;

(iv) 'Consumers' preferences are fairly evenly distributed among the different varieties of products;

(v) No firm has an institutional monopoly over the product;

(vi) Firms are free to enter its field of production;

(vii) The long-run cost curves of all the firms are identical and are U-shaped.

Reasons:

According to Chamberlin, excess capacity arises when there is no active price competition despite free entry of firms in a monopolistic competitive market. He gives the following reasons for such a situation:

(i) Firms may consider costs rather than demand in fixing prices.

(ii) They may aim at ordinary profits rather than maximum profits,

(iii) They may follow a policy of 'live and let live' and may not resort to price reduction.

(iv) They may have formal or tacit agreements, open price associations, trading association activities in building up an esprit de corps and price maintenance.

(v) There may be the imposition of uniform prices on dealers by manufacturers.

(vi) Firms may resort to excessive differentiation of the product in an attempt to turn attention away from price cutting.

(vii) Business or professional ethics prevent firms from resorting to active price competition.

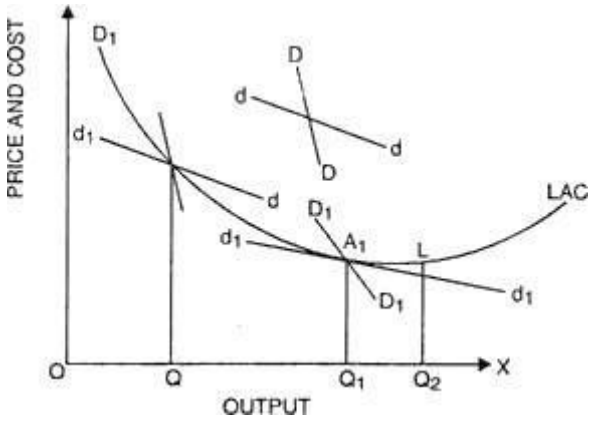


Fig.3.19

When there is no price competition due to the prevalence of these factors, the curve *dd* is of no significance and the firms are only concerned with the group DD curve. Suppose the initial short-run equilibrium is at S where the firms are earning supernormal profits because the price OP corresponding to point S is above the LAC curve. With the entry of new firms in the group, super-normal profits will be competed away. The new firms will divide the market among themselves and the DD curve will be pushed to the left as d_1d_1 in Figure 18 where it becomes tangent to the LAC curve at point A_1, This point A_1 is of stable equilibrium in the absence of price competition for all firms in the group and they are earning only normal profits. Each firm is producing and selling OQ output at QA (= OP) price.

In Chamberlin's analysis, O_1 is the 'ideal output'. But each firm in the group is producing OQ output in the absence of price competition. Thus OQ_1 represents excess capacity under non-price monopolistic competition.

Chamberlin concludes that when over long periods under non-price competition prices do not fall and costs rise, the two are equated by the development of excess productive capacity which does not possess automatic corrective. Such excess capacity may develop under pure competition due to miscalculations on the part of producers or to sudden changes in demand or cost conditions. But under monopolistic competition it may develop over long periods with impunity, prices always covering costs, and may, in fact become permanent and normal through a failure of price competition to function. The surplus capacity is never abandoned and the result is high prices and wastes. They are the wastes of monopolistic competition.

Significance of Excess Capacity:

The concept of excess capacity is of much practical significance. Prof. Kaldor has characterised it as "intellectually striking", 'a highly ingenious' and 'revolutionary doctrine.'

1. It demonstrates an untraditional possibility that an increase in supply may lead to a rise in price. The 'wastes of competition' which were hitherto a mystery have been unfolded. They pertain to monopolistic competition rather than to perfect competition, as was strongly implied by the earlier economists.
2. It establishes the truth of the proposition that perfect competition and increasing returns are incompatible and proves that falling costs ultimately lead to monopoly or monopolistic competition. When monopolistic competition prevails, the number of firms will be large. But each firm will be of a smaller size than under perfect competition.
3. This entails a wasteful use of resources by bringing up firms with lower efficiency. Such firms may employ more manpower, equipment and raw materials than is necessary. This leads to excess or unutilized capacity.

3.6. OLIGOPOLY

Oligopoly is an industry structure characterized by a few large firms producing most, or all, of the output of some product. Examples include automobiles, steel, cement, aluminium, electrical equipment industries, etc. are examples of oligopolistic markets in India.

Duopoly is a form of oligopoly. In its purest form two firms control all of the market, but in reality the term duopoly is used to describe any market where two firms dominate. Duopoly is a type of oligopoly in which there are exactly two sellers and the product sold by the two firms is homogeneous with no substitute for it. E.g.: Pepsi & Coca-Cola in the soft drink market.

Non-collusive oligopoly is a market where firms work independently and strategically by recognizing the mutual interdependence; whereas collusive oligopoly is one where firms maximize their joint profits by entering into a collusive agreement to restrict competition and to avoid uncertainties arising from oligopolistic interdependence. Oligopoly models have been broadly distinguished as Non-collusive models of Cournot, Bertrand, Stackelberg,

Chamberlin, Sweezy and Collusive models like Cartels, (OPEC), Price Leadership (Airline).

3.6.1. Game Theory

The theory of games is one of the most outstanding recent developments in economic theory. It was first presented by Neumann and Morgenstern in their classic work, Theory of Games and Economic Behaviour, published in 1944 which has been regarded as a "rare event" in the history of ideas. Game theory grew as an attempt to find the solution to the problems of duopoly, oligopoly and bilateral monopoly. In all these market situations, a determinate solution is difficult to arrive at due to the conflicting interests and strategies of the individuals and organisations. The theory of games attempts to arrive at various equilibrium solutions based on the rational behaviour of the market participants under all conceivable situations. "The immediate concept of a solution is plausibly a set of rules for each participant which tells him how to behave in every situation which may conceivably arise."

The underlying idea behind game theory is that each participant in a game is confronted with a situation whose outcome depends not only his own strategies but also upon the strategies of his opponent. It is always so in chess or poker games, military battles and economic markets. We shall be concerned mainly with the various solutions of the duopoly problem where the bargaining process is between two parties. But before we start the analysis of the theory of games, it will be useful to digress on certain fundamentals of game theory.

A game has set rules and procedures which two or more participants follow. A participant is called a player. A strategy is a particular application of the rules leading to specific result. A move is made by one player leading to a situation having alternatives. A choice is the actual alternative chosen by a player. The result or outcome of the strategy followed by each player in relation to the other is called his pay-off. The saddle point in a game is the equilibrium point. There are two types of games: constant- sum and non-constant-sum. In a constant-sum game what one player gains the other loses. The profits of the participants remain the same, whereas in a non-constant-

sum game, profits of each player differ and they may co-operate with each other to increase their profits.

Two-Person Constant-Sum or Zero-Sum Game:

In a constant-sum or zero-sum game between two players, the gain of one player is exactly equal to the loss of the other player. "There is, for each player, a strategy…. which gives him the mathematical expectation of a gain not less than, or of a loss not greater than, a certain particular value. It also shows that, if the players actually behave in this way, then those expected gains and losses are actually realised and the game has a determinate solution."

Assumptions:

The two-person constant-sum game is based on the following assumptions:

(i) A duopolistic market situation exists with firms A and B, each trying to maximize its profits,

(ii) Each is engaged in a constant-sum game so that what one firm gains, the other loses,

(iii) One firm's interest is diametrically opposed to the others,

(iv) Each firm is in a position to guess the strategy of the other as against its own strategy so as to construct the pay-off matrix for both. Lastly, each firm assumes that its opponent will always make a wise move and it would try to countermove that to protect itself from any possible loss.

Pay-off Matrix and Strategies:

Suppose firm A has three strategies for maximizing its profits. They are to improve the quality of its product, to advertise it and to reduce its price. Its rival firm B has also the same alternative strategies to profit more. A's pay-off is shown in Table 1. Since we are concerned with constant-sum games, the strategies of both A and B are depicted in one pay-off matrix, as A's gain is B's loss and vice versa.

Table 1 : Pay-off Matrix

A's Strategy →	↓ *B*'s Strategy			Row Min.
	1	2	3	
1	5	7	4	4
2	2	3	6	2
3	10	9	8	8
Col. Max.	10	9	8	8=8

In order to show how A and B will choose the various strategies consider the numerical example given in Table I. If A chooses strategy 1 with a pay-off of 5, it estimates that B will choose strategy 3 with a pay-off 4, thereby reducing A's profit to its minimum value or security value 4.

This is recorded at the end of row 1 and beginning of column 5. If A chooses strategy 2 with a value of 3, B will employ its strategy 1 to counteract A's move so that A will gain a minimum profit of 2. Finally, when A chooses strategy 3 having a value of 9, A's pay-off is reduced to 8 by B as he employs strategy 3. In employing each strategy, firm A moves cautiously and assumes that whatever strategy it employs, its rival B will always adopt that counter-strategy which will provide A with the minimum pay-off. Thus each time A adopts a technique, its profit is reduced to the minimum by B's counter-strategy.

Therefore, A will choose that strategy which gives it the minimum out of the three maximum pay-offs in each row. Thus A is interested in the "Row Min" pay-offs 4, 2, 8 shown in the last column of Table 1. It will choose strategy 3 because it provides it with the maximum-minimum or better known as maximin gain of 8 which is the highest among the row minima. This is called maximin or dominant strategy which is defined as "the worth of the game to the maximizing player because his opponent cannot prevent him from realising it."

Firm B is also cautious about the counter-strategy of its rival A. B knows that whatever move it will make in adopting a particular strategy, A will counteract it by adopting a counter-strategy, thereby leaving B with a worse pay-off. B's worse pay off means that A receives very large profit and B is left with a very little residual.

This is what B thinks about the strategy of A. Therefore, B chooses the maximum pay-off in each strategy because it thinks that by so doing it cannot prevent A from gaining that much in each column of the three strategies. If B adopts strategy 1, A will choose strategy 3, so that the worst pay-off level for B is 10. Similarly, by adopting strategy 2, the worst move gives B the maximum pay-off 9; whereas strategy 3 gives it the pay-off 8.

The maximum pay-off from each strategy is thus 10, 9 and 8 shown in "Col. Max" (column maxima) in Table 1, last row. The best of these pay-offs from B's point of view is the minimum of the column maxima, 8. It is called the minimax, and the method employed by the minimiser is the minimax strategy. This is B's dominant strategy.

The Saddle Point:

The saddle point is the equilibrium point. In the pay-off matrix of Table 1, A's pay-off from its maximin strategy 3 exactly equals B's pay-off from its minimax strategy 3 (8=8). When the minimax and the maximin in a pay-off matrix are equal, it is a strictly determined game. Both the players (firms) are guaranteed a common amount of win (profit). They cannot win more because there is a saddle point in the pay-off matrix which occurs both in the "Row Min", and "Col. Max". It is the equilibrium point 8, common to both A and B. Thus a constant-sum-two-person game is strictly determined only if it has a saddle point arrived at with pure strategy. The determinate solution of the duopoly situation discussed above is entirely based on pure strategy whereby each firm reasons out which of the several possible courses of action are the most favourable to it. In a uniquely determined game with pure strategy, there is no need for recognising mutual interdependence on the part of the duopolists. The minimax strategy followed by B cannot be improved upon by the maximin strategy adopted by A, if the pay-off matrix has a saddle point. Therefore, the duopoly situation becomes strictly determinate. The minimax strategy is an alternative to profit maximization. Through this strategy a firm minimizes the chances of the maximum loss.

Solution without Saddle Point:

However, a more realistic solution to the duopoly problem is wherein a pay-off matrix has no saddle point. Such a situation is indeterminate for there is no equilibrium point in the "Row Min", and "Col. Max." In this solution, when A chooses a strategy with a high pay-off, B chooses some other strategy with a still higher pay-off. The pay-off matrix in Table 2 illustrates this.

If A chooses strategy 1 to have a pay-off of 7, there is nothing to prevent B from choosing strategy 3 obtaining the pay-off 8. If A selects strategy 3 for the pay-off 5, B might adopt strategy 1 to profit more by having 10, and so on. In this pay-off matrix there is no equilibrium (saddle) point. If any one of the two firms employs its own strategy, it will be counteracted by the other's strategy if A sticks to its maximin strategy 3, B will gain by selecting the non- minimax strategy 1.

Table 2 : Pay-off Matrix

A's Strategy →	*B's Strategy ↓*			*Row Min.*
	1	2	3	
1	5	7	4	4
2	2	3	5	2
3	10	6	8	6
Col. Max.	10	7	8	$6 \neq 7$

It will have a pay-off 10 against A's 6. The only solution to such a problem is to employ the maximin- minimax strategies. When A employs the maximin strategy, it gains 6 while B gains 7 by employing the minimax strategy. Each fears that the other might discover its choice of strategy and so wants to play it safe to be sure of a certain minimum of profit 1, the difference between 7 and 6 measures the extent of indeterminacy. This is because the maximin and the minimax are unequal, 67. The solution is not stable.

One fundamental conclusion follows that where the pay-off matrix has no saddle point, minimax always exceeds the maximin, as is apparent from Table 2. The reason being that player (firm) A in the game always selects the maximum of the minimum rows, whereas B always chooses the minimum of the maximum columns. The minimax is thus bound to exceed the maximin. This can also be proved algebraically. Suppose aij is the maximin and aik the minimax. Since aij is a "Row Min.", it is either less than or equal to all elements in its row, including aih. However, aih cannot exceed aik of the "Col. Max." which is the maximum in its column.

Thus aij < aih < aik.

Mixed Strategies:

But the duopoly problem without a saddle point can be solved by allowing each firm to adopt mixed strategies. A mixed strategy refers to the introduction of an element of chance in choice making on a probabilistic basis. It "is a probability distribution that assigns a definite probability to the choice of each pure strategy in such manner that the sum of the probabilities is unity for each participant." It is just giving a player a set of dice to throw and determine the strategy to be chosen. Each player has a pair of mixed strategies that leads to an equilibrium position.

Each tries to have the most desirable expected value of the game (or pay-off) as against his rival; and is therefore, in search of a set of probabilities for his mixed strategy so as to have the highest expected pay-off. This is known as the optimal mixed strategy. If the game has value V, A till try to have the highest expected pay-off V by playing his mixed strategy; playing the same mixed strategy, B will try to keep A's expected pay-off to the minimum V.

To illustrate, the pay-off matrix in Table 3 is used where each duopolist has two strategies 1 and 2. This Table has no saddle point. Both resort to the game of dice to arrive at a solution. The rule is that if A throws the dice and the result is 1 or 2, he will choose strategy 1 and if the result is 3, 4, 5 or 6, he chooses strategy 2. Following this rule, the probability of A choosing strategy 1 is 1/3, and of choosing strategy 2 is 2/3. B will employ the same strategies but with opposite probabilities in order to keep A's expected pay-off to the minimum.

Pay-off Matrix

A's Strategies	B's Probabilities / A's Probabilities	↓ 1	2
		2/3	1/3
→ 1	1/3	6	4
2	2/3	2	6

The probability of B choosing strategy 1 is 2/3, and of choosing strategy 2 is 1/3. Thus each must choose both the probabilities. The expected value of the game V for A = 1/3×2/3×6+1/3×1/3×4+2/3×2/3×2+2/3x 1/3×6=36/9=4.

Similarly, the expected value of the game V for B = 2/3×1/3x 6+2/3×2/3×2+1/3×1/3×4+1/3×2/3×6 = 36/9 = 4. Each duopolist will try to maximise the "mathematical expectation of his profit" rather than the profit itself. The expected pay-off or the mathematical expectation of profit for each of the duopolists equals the value of the game, (F=4) when both adopt their optimal probabilities. If A uses his optimal mixed strategy, his expected pay-off cannot be less than V, whatever B's choice of strategies may be. Similarly, if B uses his optimal strategy, his expected loss cannot be greater than V, whatever A's choice of strategies may be. Thus the problem is always determinate when mixed strategies are employed.

Non-Constant-Sum Games:

In constant-sum game no player is able to affect the combined pay-off. But in non-constant-sum game if player A employs an optimal mixed strategy, player B can increase his expected pay-off by not following the same mixed strategy. The solution lies in either collusion or non-collusion between the two players. The former is known as cooperative non-constant-sum game and the latter as non-cooperative non-constant-sum game.

3.6.2. Nash Equilibrium:

In the cooperative non-constant-sum game, the most rational thing for the two players is to collude and thus to increase their combined pay-off without reducing any one's pay-off. But the problem is not as simple as it appears. It is too much to expect the players to act rationally, especially when the problem is one of distributing their joint profit equitably. The Nash Equilibrium tries to arrive at a "fair division" by evaluating the pay-off for both players. In Nash equilibrium, each player adopts a strategy that is his best choice, given what the other player does. To explain Nash equilibrium, take two players who are involved in a simple game of writing words. The game assumes that each player writes two words independently on a paper. Player A writes 'top' or 'bottom' and player B writes 'right' and 'left'. Then the scrutinization of their papers reveal- the pay-off got by each is, as shown in Table 4.

Suppose player A prefers the top and player B prefers the left from the Top-Left box of the matrix. It is seen that the pay-off to player A is 2 as the first

entry in the left box, and pay-off to player B is the second entry, 4 in this box. Next if the player A prefers bottom and player B prefers right then the pay-off to player A is 2 and to player B is 0 in the Bottom-Right box. From the above, we can infer that player A has two strategies; he can choose either the top or the bottom. From the point of view of player A, it is always better for him to prefer the bottom because the choices 4 and 2 are greater than the figures at the top. Likewise, it is always better for player B to prefer left because the choices 4 and 2 are greater than the figures at the right i.e. 2 and 0. Here the equilibrium strategy is for player A to prefer the bottom and for player B to prefer the left.

The above matrix reveals that there is one optimal choice of strategy for a player without considering the choice of the other player. Whenever player A prefers the bottom, he will get a higher pay-off irrespective of what player B prefers. Similarly, player B will get a higher pay-off if he prefers left irrespective of what player A prefers. The preferences bottom and left dominate the other two alternatives and hence we get equilibrium in dominant strategies. But the dominant strategy equilibrium does not occur often. The matrix in Table 5 shows an example of this particular phenomenon.

Table 5 : Pay-off Matrix

		Player B	
		Left	*Right*
Player A	*Top*	[4] 2	[0] 0
	Bottom	[0] 0	[2] 4

In the above matrix when player B prefers the left, the pay-offs to player A are 4 and 0 because he prefers the top. Likewise when player B prefers the right, the pay-offs to player A are 0 and 2 because he prefers the bottom. When player B prefers the left, player A would prefer the top, and again when player B prefers the right, player A would prefer the bottom. Here the optimal choice of player A is based on what he imagines player B will do.

A Nash equilibrium can be interpreted as a pair of expectations about each player's choice such that when the other player's, choice is revealed in the above matrix, the strategy Top-Left is a Nash equilibrium. In a Nash

equilibrium, no player has an incentive to depart from it by changing his own behaviour.

Non-Cooperative Non-Constant Sum Games:

If collusion is ruled out, we enter the realm of non-cooperative non-constant-sum games where each player acts on his guesses about the other's choice of strategy. Non-cooperative non-constant- sum games may be of a variety of types. The two players guided by self-interest, as they are likely to be, may select strategies which may be mutually harmful. Prof. Tucker's "'prisoner's dilemma" is an interesting case of a non-constant-sum game where two prisoners are brought for interrogation separately.

Each is aware that both will be let off if neither confesses. But each is warned that if one who confesses will be let off and the other who does not confess will be awarded heavy punishment. Thus both, in trying to protect themselves, will confess and receive punishment. This example is important in pointing out that the various measures like taxation, rationing, etc., adopted by the government are designed, at least in part, to achieve the cooperation which alone can prevent the loss to each player from his trying to protect himself when Vie has no assurance that others will behave as required by their mutual interest."

A non-cooperative non-constant-sum game may have several pairs of strategies with saddle points, but they may not have the same pay-off. Further, if a_{11} and b_{11}, and a_{2l} and b_{2l} are pairs of equilibrium strategies, it is not essential that a_{11} and b_{2l} or a_{21} and $b_{11}$are also equilibrium pairs. If the players do not choose equilibrium pairs of strategies, both may be losers.

It is also possible that one player in a non-constant-sum game may publicise his strategy as threat information or for providing information to his opponent for having some sort of quasi-collusion with him which may be mutually beneficial.

Limitations of Game Theory:

Game theory has the following limitations:

Firstly, game theory assumes that each firm has knowledge of the strategies of the other as against its own strategies and is able to construct the pay-off matrix for a possible solution. This is a highly unrealistic assumption and has

little practicability. An entrepreneur is not fully aware of the strategies available to him, much less those available to his rival. He can only have a guess of his and his rival's strategies.

Secondly, the theory of games assumes that both the duopolists are prudent men. Each rival moves on this presumption that his opponent will always make a wise move and then he adopts a countermove. This is an unrealistic assumption because entrepreneurs do not always act rationally. But it an entrepreneur is not prudent, he cannot play either the maximin or minimax strategy. Thus the problem cannot be solved.

Thirdly, the various strategies followed by a rival against the other lead to an endless chain of thought which is highly impracticable. For instance, in Table 1, there is no end to the chain of thought when A chooses one strategy and B adopts a counter-strategy and vice versa.

Fourthly, it is easy to understand a two-person constant-sum game. But as the analysis is elaborated to three or four person games, it becomes complex and difficult. However, the theory of games has not been developed for games with more than four players. Most economic problems involve many players. For instance, the number of sellers and buyers is quite large in monopolistic competition and the game theory does not provide any solution to it.

Fifthly, even in its application to duopoly, game theory with its assumption of a constant-sum game is unrealistic. For it implies that the "stakes of interest" are objectively measurable and transferable. Further, the minimax principle which provides a solution to the constant-sum game assumes that each player makes the best of the worst possible situation. How can the best situation be known if the worst does not arise? Moreover, most entrepreneurs act on the presumption of the existence of favourable market conditions and the question of making the best of the worst does not arise at all.

Sixthly, the use of mixed strategies for making non-zero sum games determinate is unlikely to be found in real market situations. No doubt random choice of strategies introduces secrecy and uncertainty but most entrepreneurs, who like secrecy in business, avoid, uncertainty. It is, however, possible that an oligopolist may wish his rivals to know his business

secrets and strategies for the purpose of entering into collusion with them in order to earn maximum joint profits.

Conclusion:

Thus like the other duopoly models, game theory fails to provide a satisfactory solution to the duopoly problem. "Although game theory has developed far since 1944," writes Prof. Watson, its contribution to the theory of oligopoly has been disappointing." To date, there have been no serious attempts to apply game theory to actual market problems, or to economic problems in general. Despite these limitations, game theory is helpful in providing solutions to some of the complex economic problems even though as a mathematical technique, it is still in its development stage.

Importance of Game Theory:

Game theory possesses the following merits:

1. Game theory shows the importance to duopolists of finding some way to agree. It helps to explain why duopoly prices tend to be administered in a rigid way. If prices were to change often, tacit agreements would not be found and would be difficult to enforce.

2. Game theory also highlights the importance of self-interest in the business world. In game theory, self-interest is routed through the mechanism of economic competition to bring the system to the saddle point. This shows the existence of the perfectly competitive market.

3. Game theory tries to explain how the duopoly problem cannot be determined. For this, it uses the solution without saddle point under constant-sum-two-person game. At the same time, the duopoly problem without a saddle point is solved by allowing each firm to adopt mixed strategies on a probability basis. In this way, the duopoly problem is shown to be always determined.

4. Further, game theory has been used to explain the market equilibrium when more than two firms are involved. The solution lies in either collusion or non-collusion. These are known as cooperative non-constant-sum game and non-cooperative non-constant-sum game respectively.

5. "Prisoner's Dilemma" in game theory points towards collective decision making and the need for cooperation and common rules of road.

6. A player in game theory may be regarded as a single person or an organisation in the real world subject to decision making with a certain amount of resources. The strategy in game theory is a complete specification of what a player will do under each circumstance in the playing of the game. For example, the Director of a firm might tell his sales staff how he wants an advertising campaign to start and what should they do subsequently in response to various actions of competing firms.

7. The importance of the pay-off values lies in predicting the outcome of a series of alternative choices on the part of the player. Thus a perfect knowledge of the pay-off matrix to a player implies perfect predictions of all factors affecting the outcome of alternative strategies. Moreover, the minimax principle shows to the player the next course of action which would minimise the losses if the worst possible situation arose.

8. Again, game theory is helpful in solving the problems of business, labour and management. As a matter of fact, a businessman always tries to guess the strategy of his opponents so as to implement his plans more effectively. Similar is the case of management in trying to solve the problem of labour union's bargaining for higher wages. Management might adopt the most profitable counter-strategy to tackle such problems. Further, producers might make decisions in which estimation of profits were to be balanced against the cost of production.

9. Last but not the least, there are certain economic problems which involve risk and technical relations. They can be handled with the help of the mathematical theory of games. Problems of linear programming and activity analysis can provide the main basis for economic application of the theory of games.

3.7. Non collusive oligopoly

Non collusive oligopoly is a market in which the firms act independently. They compete with each other and determine independently the price of their products. There are few firms in the market. Each firm pursues its own price and output policy independent of the rival firms. Therefore in this market, aggressive advertisement develops through brand loyalty. It can be known as non-collusive oligopoly.

Non – collusive oligopoly models, namely,

1. The Cournot's duopoly Model
2. The Chamberlin duopoly Model
3. The Bertrand's duopoly Model
4. The Edgeworth duopoly Model
5. The Stackelberg duopoly model

3.7.1. COURNOT'S DUOPOLY MODEL:

Augustin Cournot, a French economist, was the first to develop a formal duopoly model in 1838.

To illustrate his model, Cournot assumed:

(a). Tow firms, each owing an mineral water well

(b). Each seller acts on the assumption that his competitor will not react to his decision to change his and price. This is Cournot's behavioural assumption.

On the basis of this model, Cournot has concluded that each seller ultimately supplies one-third of the market and charges the same price. While one-third of the market remains unsupplied.

Diagram Representation:

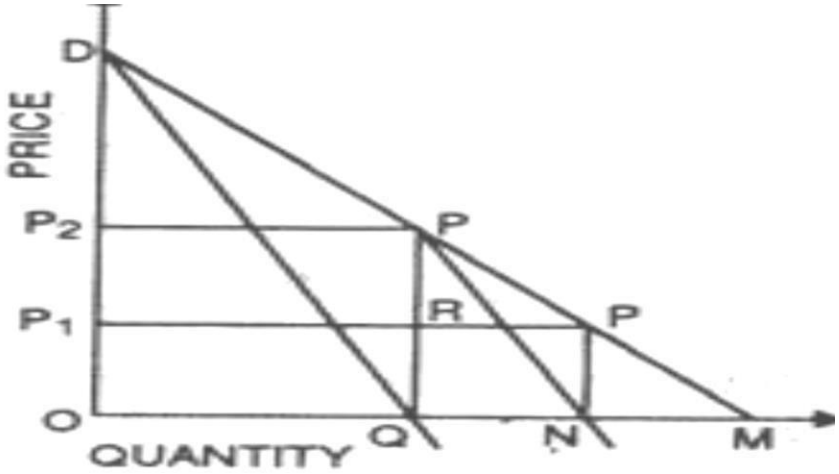


Fig.3.20 Cournot Model

Cournot's duopoly model is presented in Fig.3.20. To begin the analysis, suppose that there are only two firms. A and B, and that, initially. A is the only seller of mineral water in the market. In order to maximize his profits (or revenue), he sells quantity OQ where his MC = O MR, at price OP2 His total profit is OP2PQ. Now let B enters the market. The market open to him is QM

which is half of the total market. He can sell his product in the remaining half of the market. He assumes that A will not change his price and output as he is making the maximum profit i.e., A will continue to sell OQ at price OP2 Thus, the market available to B is QM and the demand curve is PM. When to get maximize revenue, B sells ON at price OP1, His total revenue is maximum at QRP'N. Note that B supplies only QN = 1/4 = (l/2)/2 of the market.) With the entry of B, price falls to OP1 Therefore, A's expected profit falls to OP1 PQ Faced with this situation, A attempts to adjust his price and output to the changed conditions. He assumes that B will not change his output QN and price OP1 as he is making maximum profit. Any further attempt to adjust output produces the same result. The firms, therefore, reach their equilibrium position where each one supplies one-third of the market.

3.7.2. CHAMBERLIN'S OLIGOPOLY MODEL

According to the Chamberlin theory of oligopoly, a stable equilibrium can be reached with the monopoly price being charged by all firms, if firms recognize their interdependence and act so as to maximize the industry profit (monopoly profit). Chamberlin accepts that if firm do not recognize their interdependence, the industry will reach either the Cournot equilibrium, if each firm acts independently on the assumption that the rivals will keep their output constant; or the industry will reach the Bertrand equilibrium if each firm acts independently, trying to maximize its own profit on the assumption that the other rivals will keep their price unchanged.

However, Chamberlin's theory differs with the assumption of independent action by competitors. According to him, in contrast to the Bertrand and Cournot assumption, the firms do in fact recognize their interdependence. When changing their price and output, the firms do recognize the direct and indirect effects of their decisions. The direct effects are those which would occur if competitors were assumed to remain passive. The indirect effects are those which result from the fact that rivals do not in fact remain passive but react to the decisions of the firm which changes its prices or output. The recognition of the full effects (direct and indirect) of a change in the firm's

output (or price), results in a stable industry equilibrium with the monopoly price and monopoly output.

Chamberlin assumes that the monopoly solution (with industry or joint profits being maximized) can be achieved without collusion: the entrepreneurs are assumed to be intelligent enough to quickly recognize their interdependence, learn from their past mistakes and adopt the best (for all) position, which is charging the monopoly price. Chamberlin model has been illustrated in Figure 2. In this figure DQ is the market demand curve. If firm A is first to enter the market, it will produce output OQ_1 because at this level of output its marginal revenue is equal to marginal cost (MR = MC = 0). The firm can charge price

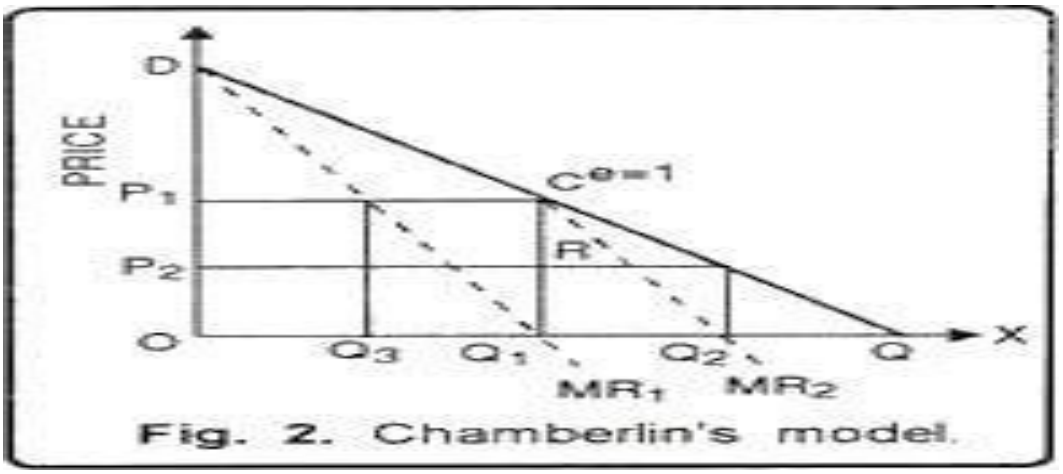


Fig. 2. Chamberlin's model.

OP_1 which is the monopoly price. Firm B entering market at this stage considers that its demand curve is CQ and will thus produce Q_1Q_2 so as to maximise its profit. It will charge price OP_2.

It now realizes that it cannot sell QQ_1 quantity at the monopoly price and thus decides to reduce the output to QQ_3, which is one-half of the monopoly output QQ_1. Firm B can continue to produce quantity Q_1Q_2 which is same as Q_3Q_1. The industry output thus is OQ_1 and the price rises to the level OP_1. This is an ideal situation from the point of view of both firms A and B. In this case, the joint output of the two firms is monopoly output and they charge monopoly price. Thus, considering the assumption of equal costs (costs = 0) the market will be shared equally between firms A and B. Without collusion

joint profit maximisation is impossible unless all firms have identical costs and demands.

Critical Evaluation of Chamberlin's Oligopoly Model

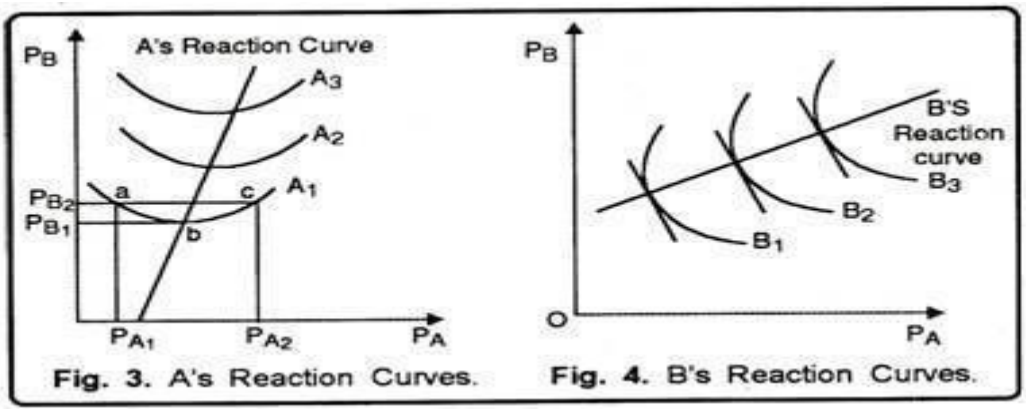
Chamberlin's model is an advance over the previous models (Bertrand and Cournot) in that it assumes that the firms are sophisticated enough to realize their interdependence. Their behaviur leads them to the monopoly solution of output and pricing which ensures maximization of joint profits though they do not formally collude.

However, joint profit maximization via non-collusive action is not that simple. Various difficulties may arise in such action because it implies that firms have a good knowledge of the market demand curve and that they learn from their mistakes and realize that the ultimate consequence of alternative chain of adjustments to rival's moves will be less profitable than sharing the monopoly profits equally with him. That is, they somehow acquire knowledge of the total supply curve (that is of the individual costs of the rivals) and hence they define the (monopoly) price which is best for the group as a whole. Further, it is assumed in Chamberlin's model that the oligopolist know fully the costs of production of their rivals which enable them to arrive at a monopoly output and price which is in the best interest of all of them. Thus, unless all oligopolists have identical costs and demands, it seems impossible that the oligopolist will be able to reach monopoly solution, that is, maximization of joint profits without collusion.

3.7.3. Bertrand duopoly model

Bertrand, a French Mathematician developed his own model of duopoly in 1883. Bertrand's model differs from Cournot's model in respect of its behavioural assumption. While under Cournot's model, each seller assumes his rival's output to remain constant, under Bertrand's model each seller determines his price on the assumption that his rival's price, rather than his output, remains constant. Bertrand's model focuses on price competition. His analytical tools are reaction function of the duopolists. Reaction functions are derived on the basis of iso-profit curves. An iso-profit curve, for a give level of profit, is drawn on the basis of various combinations of prices charged by the rival firms. He assumed only two firms, A and B and their prices are measured

along the horizontal and vertical axes, respectively. Their iso-profit curves are drawn on the basis of the prices of the two firms. Iso-profit curves of the two firms are concave to their respective prices axis, as shown in Fig. 3 and 4. Iso-profit curves of firm A are convex to its price axis PA (Fig. 3) and those of firm B are convex to PB (Fig. 4). In Figure 3, we have curve A, which shows that A can earn a given profit from the various combinations of its own and its rival's price. For example, price combinations at points, a, b and c yield the same level of profit indicated by the iso-profit curve A1. If firms B fixes its prices Pb1– firm A has two alternative prices, Pa1 and Pa2, to make the same level of profits. When B reduces its price, A may either raise its price or reduce it.



A will reduce its price when he is at point c and raise its price when he is at point a. But there is a limit to which this price adjustment is possible. This point is shown by point b. So there is a unique price for A to maximize its profits. This unique price lies at the lowest point of iso-profit curve. The same analysis applies to all other iso-profit curves, A1 A2 and A3 we get A's reaction curve. Note that A's reaction curve has a rightward slant. This is so because, iso-profit curve tends to shift rightward when A gains market from his rival B. Following the same process, B's reaction curve may be drawn as shown in Fig. 4. The following figure.5. The equilibrium of duopolists suggested by Bertrand's model may be obtained by putting together the reaction curves of the firms A and B as shown in Fig. 5. The reaction curves of A and B intersect at point E where their expectations materialize, point E is therefore equilibrium point. This equilibrium is stable. For, if any one of the firms

disagrees to this point, it will create a series of actions and reactions between the firms which will lead them back to point E.

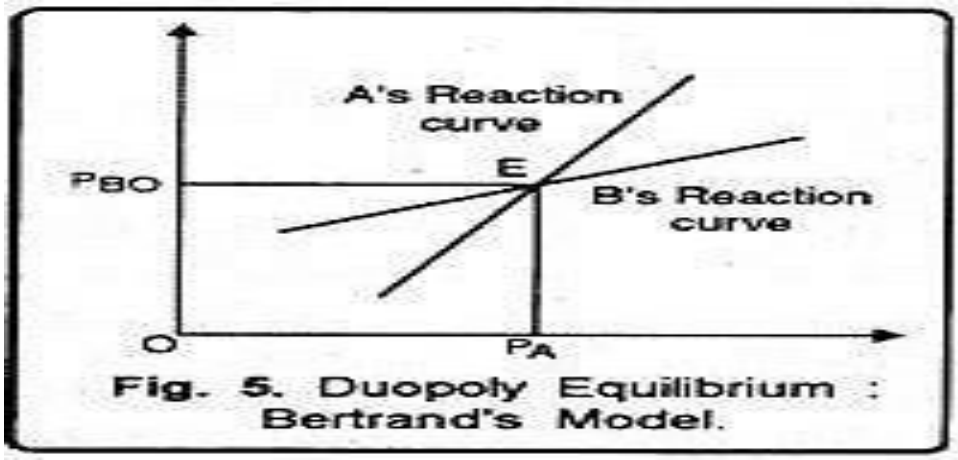


Fig. 5. Duopoly Equilibrium : Bertrand's Model.

Criticism of the Model: Bertrand's model has been criticised on the same grounds as Cournot's model. Bert- rand's implicit behavioural assumption that firms never learn from their past experience seems to be unrealistic. If cost is assumed to be zero, price will fluctuate between zero and the upper limit of the price, instead of stabilizing at a point.

3.7.4. EDGEWORTH'S DUOPOLY MODEL:

Edgeworth developed his model of duopoly in 1897. Edgeworth's model follows Bertrand's assumption that each seller assumes his rival's price, instead of his output, to remain constant. His model is illustrated in Fig. 6.

In this figure we have supposed that there are two sellers, A and B, in the market who face identical demand curves. A has his demand curve DDA

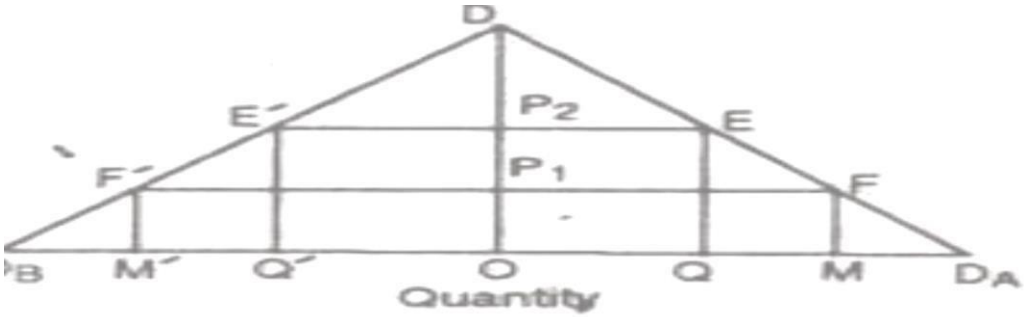


Fig. 6. Edgeworth's Model of Duopoly.

and as DDA Let us also assume that seller A has a maximum capacity of output OM and B has a maximum output capacity of OM'. The ordinate ODA measures the price. To explain Edgeworth's model, let us assume, to begin with, that A is the only seller in the market. Following the profit maximising rule of a monopoly seller, he sells OQ and charges a price, OP2. His monopoly

profit under zero cost, equals OP2EQ Now, let B enter the market. B assumes that A will not change his price since he is making maximum profit. He sets his price slightly below A's price (OP2) and is able to sell his total output. At this price, he captures a substantial part of A's market. Seller A, on the other hand that his sales have gone down. In order to regain his market, A sets his price slightly below B's price. This leads to price-war between the sellers.

The price- war takes the form of price-cutting which continues until price reaches OP1 At this price both A and B are able to sell their entire output- A sells OQ and B sells OQ' The price OP1 could therefore be expected to be stable. But, according to Edgeworth, price OP1 should not be stable.

Simple reason is that, once price OP1 is set in the market, the sellers observe an interesting fact. This is, each seller realise that his rival is selling his entire output and he will therefore not change his price, and each seller thinks that he can raise his price to OP2 and can make pure profit. This realisation forms the basis of their action and reaction. For examples, let seller A take the initiative and raise his price to OP2. Assuming A to retain his price OP2.B finds that if he raises his price at a level slightly below OP2 he can sell his entire output at a higher price and make greater profit. Therefore, B raises his price according to his plan.

Now it is A's turn to know the situation and react. A finds that his price is higher than B's price and his total sale has fallen. Therefore assuming B to retain his price, A reduces his price slightly below B's price. Thus, the price-war between A and B begins once again. This process continues indefinitely and price keeps moving up and down between OP1 and OP2 Obviously, according to Edgeworth's model of duopoly, equilibrium is unstable and indeterminate since price and output are never determined.

3.7.5. Sweezy Kinked demand curve model

One of the important features of oligopoly market is price rigidity. And to explain the price rigidity in this market, conventional demand curve is not used. The idea of using a non-conventional demand curve to represent non-collusive oligopoly (i.e., where sellers compete with their rivals) was best explained by Paul Sweezy in 1939. Sweezy uses kinked demand curve to describe price rigidity in oligopoly market structure.

The kink in the demand curve stems from the asymmetric behavioural pattern of sellers. If a seller increases the price of his product, the rival sellers will not follow him so that the first seller loses a considerable amount of sales. In other words, every price increase will go unnoticed by rivals.

On the other hand, if one firm reduces the price of its product other firms will follow the first firm so that they must not lose customers. In other words, every price will be matched by an equivalent price cut. As a result, the benefit of price cut by the first firm will be inconsiderable. As a result of this behavioural pattern, the demand curve will be kinked at the ruling market price.

Suppose, the prevailing price of an oligopoly product in the market is QE or OP of Fig. 3.21. If one seller increases the price above OP, rival sellers will keep the prices of their products at OP. As a result of high price charged by the firm, buyers will shift to products of other sellers who have kept their prices at the old level. Consequently, sales of the first seller will drop considerably.

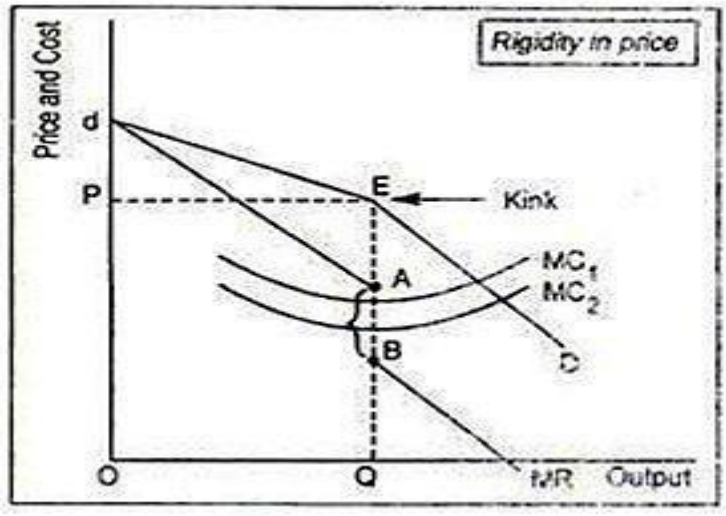


Fig.3.21. Kinked Demand curve

That is why demand curve in this zone (dE) is relatively elastic. On the other hand, if a seller reduces the price of his product below QE, others will follow him so that demand for their products does not decline. Thus, demand curve in this region (i.e., ED) is relatively inelastic. This behavioural pattern thus explains why prices are inflexible in the oligopoly

market — even if demand and costs change. The kink in the demand curve at point E results in a discontinuous MR curve.

The MR curve has two segments:

At output less than OQ the MR curve (i.e., dA) will correspond to DE portion of AR curve, and, for output larger than OQ, the MR curve (i.e., BMR) will correspond to the demand curve ED. Thus, discontinuity in MR curve occurs between points A and B. In other words, between these two points, MR curve is vertical. Equilibrium is achieved when MC curve passes through the discontinuous portion of the MR curve. Thus the equilibrium output is OQ, to be sold at a price OP.

Suppose, costs rise. As a result, MC curve will shift up from MC_1 to MC_2. The resulting price and output remain unchanged at OP and OQ, respectively. This fact explains stickiness of prices. In other words, in oligopolistic industries price is more stable than costs. At first sight, the model seems to be attractive since it explains the behaviour of firms realistically. But the model has certain limitations. Firstly, it does not explain how the ruling price is determined. It explains that the demand curve has a kink at the ruling price. In this sense, it is not a theory of pricing. Secondly, price rigidity conclusion is not always tenable. Empirical evidence suggests that higher costs force a further price rise above the kink. Despite these limitations, the model is popular among textbook authors.

Collusive Oligopoly Model: Price Leadership Model:

Non-collusive oligopoly model (Sweezy's model) presented in the earlier section is based on the assumption that oligopoly firms act independently even though firms are interdependent in the market. A vigorous price competition may result in uncertainty.

The question that arises now is: how do oligopoly firms remove uncertainty? In fact, firms enter into pricing agreements with each other instead of adopting competition or price war with each other. Such agreement—both explicitly (or formal) and implicit (or informal)—may be called collusion.

Always, every firm has the inclination to achieve more strength and power over the rival firms. As a result, in the oligopolist industry, one finds the emergence of a few powerful competitors who cannot be eliminated easily by other powerful firms. Under the circumstance, some of these firms act together or collude with each other to reap maximum advantage. In fact, in oligopolist industry, there is a natural tendency for collusion. The most important forms of collusion are: price leadership cartel and merger and acquisition.

When a formal collusive agreement becomes difficult to launch, oligopolists sometimes operate on informal tacit collusive agreements. One of the most common form of informal collusion is price leadership. Price leadership arises when one firm—may be a large as well as dominant firm—initiates price changes while other firms follow. An example of dominant firm price leadership is shown in Fig. 3.22 where D_T is the industry demand curve. Since small firms follow the leader—the dominant firm—they behave as "price-takers". MCs is the horizontal summation of the MC curves of all small firms.

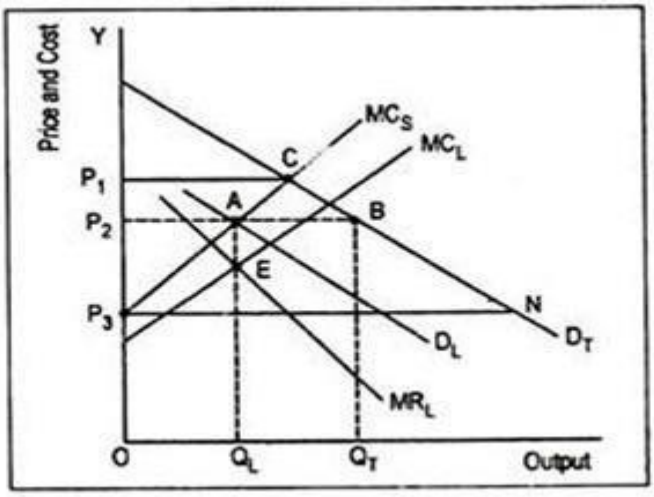


Fig.3.22 price leadership model

Suppose, the dominant firm sets the price at OP_1 (where D_T and MCs intersect each other at point C). The small firms meet the entire demand P_1C at the price OP_1. Thus, the dominant firm has nothing to sell in the market. At a price of OP_3, the small firm will supply nothing. It is obvious that price will be set in between OP_1 and OP_3 by the leader.

The demand curve faced by the leader firm of the oligopoly industry is determined for any price—it is the horizontal distance between industry demand curve, D_T, and the marginal cost curves of all small firms, MC_S. In Fig.3.22, D_L is the leader's demand curve and the corresponding MR curve is MR_L. Being a leader in the industry, the dominant firm's supply curve is represented by the MC_L curve. Since it enjoys a cost advantage, its MC curve lies below the MC_S curve. A dominant firm maximizes profit at point E where its MC_L and MR_L intersect each other. The corresponding output of the price leader is OQ_L. Price thus determined is OP_2. Small firms accept this price OP_2 and sell Q_LQ_T (=AB) amount – industry demand the OQ_T output. In actual practice, the analysis of price leadership is complicated, particularly when new firms enter the industry and try to become the leader or dominant.

Collusive Oligopoly—Merger and Acquisition:

Another method to remove price war among oligopoly firms is merger. Merger may be defined as the consolidation of two or more independent firms under single ownership. When a firm purchases assets of another firm, acquisition takes place. Merger and acquisition take place because the management comes to a conclusion that a consolidated firm is powerful than the sum of individual firms. Since basically the difference between cartel and merger is a legal one, we won't consider mergers and acquisitions. The marginality principle applied in the case of profit maximizing cartel is also applicable in the case of merger.

Conclusion:

Can we make some definite conclusions from the oligopolistic market structure? Though one can make unambiguous predictions about perfect competition as well as monopoly, no such predictive element of an oligopolistic competition exists. It is, thus, a perplexing market structure. One important characteristic of an oligopoly market is interdependence among sellers. Each seller's price-output decision is influenced by the perceptions of countermoves of rival sellers. Given the large number of possible reactions, we come up with different models based on different assumptions about the behaviour of the rival sellers, the extent and form

of exit and entry, the likelihood of collusion between firms. 'Unfortunately, economic theory does not suggest which assumptions to use. In any event, each of these theories must ultimately stand or fall on its predictive powers'.

3.8. COLLUSIVE OLIGOPOLY

Collusive oligopoly the competing firms collude in order to reduce the uncertainties cropping out of the inherent rivalries among them. The colluding firms are usually bound by agreements whereby they seek to maximise the joint profit of the group. OPEC is an example of such type of collusion.

We would analyse the behaviour of firm by considering — Cartels, Mergers, Price Leadership and Basing-point Price System.

1. **Cartels** are formed among the firms due to the uncertainty arising out of mutual interdependence. A cartel is a group of independent market participants who collude with each other in order to improve their profits and dominate the market.

2. **Mergers** If firms in an oligopolistic industry cannot form a cartel or accept leadership, then they have another way out that will save them from any price war. That is to eliminate rivalry through merger. A Merger is the consolidation of two or more independent firms into a single firm.

3. **Price Leadership** in this form of collusion, one firm sets the price and the rest follow. This helps to reduce the uncertainty about the competitors' reactions, even though the firms may have to depart from their profit maximising position. Price leadership is more widespread than cartels because it allows the members complete freedom regarding their product and selling activities. Such an arrangement is more acceptable to the followers than a complete cartel, which requires the surrendering of all freedom of action to the central agency. (Air India)

4. **Basing-point Price System:**

Basing-point pricing has been adopted often in practice by oligopolists producing a homogeneous product whose transportation costs are relatively higher and whose production requires a large plant, if full economies of scale (minimum production costs) are to be realised.

3.8.1. Collusive Models

Collusive oligopoly is a form of the market, in which there are few firms in the market and all of them decide to avoid competition through a formal agreement. They collude to form a cartel, and fix for themselves an output quota and a market price.

(i) Cartel: OPEC- A Case Study of a Cartel

Cartel is an organization created from a formal agreement between groups of producers of a good or service to regulate the supply in an effort to regulate prices. Cartel, producers or countries act together as a single producer and by controlling production and marketing influencing the prices. The cartel is successful in creating an oligopoly. Though cartel has market power but not as like in monopoly. OPEC-Organization of Petroleum Exporting Countries was set up in 1973. The behavior of OPEC provides an example of cartelization of an industry that contained a large number of competitive firms most of which were price- takers. Before 1973, the oil industry was not perfectly competitive. There was several oil producing countries, so no country by withholding his output in the market influences the prices. But OPEC attracted attention in 1973 when its members voluntarily agreed to restrict their outputs by negotiating quotas for the first time. During 1973, OPEC countries accounted for about 70 percent of the world oil exports. As a result of this output restriction, OPEC countries succeed in raising prices of oil in the world market.

OPEC as a Successful Cartel

How OPEC was successful in restricting output and influencing prices is shown in Figure 3.21. Price is measured on y-axis and quantity on x - axis. Sw is the world supply curve. SN is the non OPEC supply curve of oil. S'w is also the world supply curve after fixation of production by OPEC. PW is the world price and DD is the world's demand curve for oil. Now suppose OPEC by fixing its production quota, OPEC shifted the world supply curve to S'W and the horizontal difference between SN and S'W shows the production by OPEC. Now the new world supply curve S'W intersects demand curve DD at E1. The new world higher price is now P'W. At price P' W, the total quantity of oil produced is OQ2 out of which OQ3 is produced by non-OPEC and Q3 Q2

[OQ2-OQ3] by OPEC. When the OPEC countries were prepared to supply all that was demanded at the world price PW, the world supply curve was SW. The world's supply cuts the world's demand curve for oil DD at point E. At price PW, the total quantity of oil produced is OQ out of which OQ1 was produced by non- OPEC countries and Q1Q [OQ- OQ1] by OPEC. As a result, with higher prices OPEC increased its oil revenues. Though there was decline in the sale by the OPEC countries but price rises more than a fall in sales. Non-OPEC countries also gain because they were also selling at new higher world price.

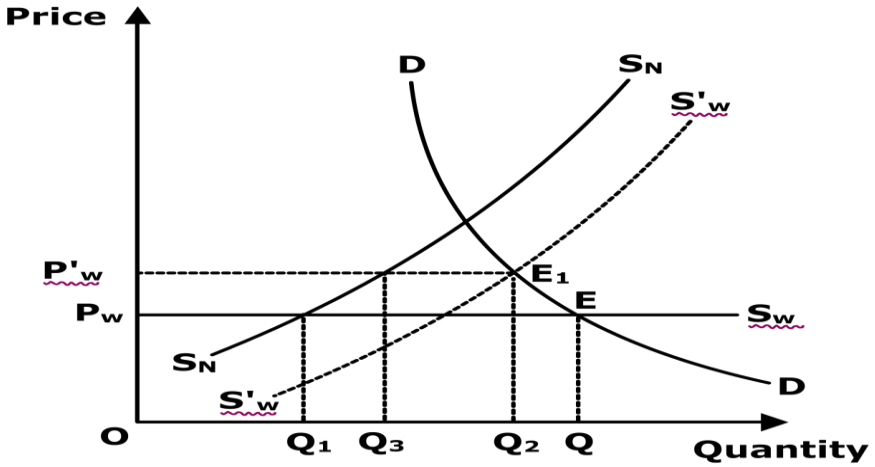


Fig.3.21 (OPEC)

3.8.2. Price Leadership

Price leadership is an important form of Collusive oligopoly. Under price leadership, the leader firm sets the price and other firms follow it. The price leader firm has major share of total sales, and a group of smaller firms supply

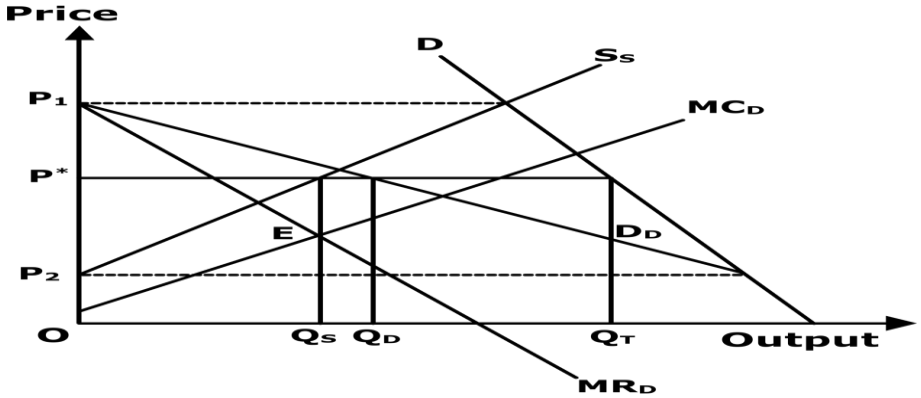


Fig.3.22. price leadership

the remainder of the market. The large firm acts as a dominant firm which sets a price that maximizes his own profit. The other firms have no option but to take the price set by the dominant firm as given and maximize

their profits accordingly. These other firms have very small share of total sales, so individually other firms would have very little influence over the price. Thus, other firms act as perfect competitors and take price decided by dominant firm as given. When leader firm maximizes its profit it takes into account how the output of the other firms depends on the price it sets. It is shown in figure 3.22.

In the figure, price is measured on Y-axis and quantity on X- axis. D is the market demand curve which is negatively sloped. SS is the supply curve. DD is the demand curve of dominant firm. The demand curve of the dominant firm is the difference between market demand and the supply curve of followers firm. At price OP1, the market demand is equal to the supply by the followers firm, so the dominant firm can sell nothing at this price. At price OP2 or less, the follower firm will not supply any good. So, at price OP2 or less the dominant firm faces the market demand curve D. And between prices OP2 and OP1, the dominant firm faces the demand curve DD. Corresponding to demand curve DD faced by the dominant firm, the dominant's firm is facing marginal revenue MRD. MCD is the marginal cost faced by the dominant firm. The dominant firm in order to maximize profit should produce a level of output where marginal revenue is equal to marginal cost. The dominant firm is maximizing profit at point E where marginal revenue is equal to marginal cost. The equilibrium price is OP* and the equilibrium quantity produced by the dominant firm is OQD. At this price, follower firms sell a quantity OQS. The total quantity that is sold at price OP* is OQT which is the sum of the quantity produced by dominant firms (OQD) and the quantity produced by the small firms (OQs).

3.8.3. Types of Price Leadership:

Price leadership helps in stabilizing prices and maintaining price discipline. There are three major types of price leadership, which are present in industries over a passage of time.

These three types of price leadership are explained as follows:

i. Dominant Price Leadership

ii. Barometric Price Leadership

iii. Aggressive Price Leadership

i. Dominant Price Leadership:

Dominant price leadership in which only one organization dominates the entire industry. Under dominant price leadership, other organizations in the industry cannot influence prices. The dominant organization uses its power of monopoly to maximize its profits and other organizations have to adjust their output with the set price.

The interests of other organizations are ignored by the dominant organization. Therefore, dominant price leadership is sometimes termed-as partial monopoly. Price leadership by the leading organization is most commonly seen in the industry.

ii. Barometric Price Leadership:

Barometric price leadership in which one organization declares the change in prices at first and assumes that other organizations would accept it. The organization does not dominate others and need not to be the leader in the industry. Such type of organization is known as barometer.

This barometric organization only initiates a reaction to changing market situation, which other organizations may follow it if they find the decision in their interest. On the contrary, the leading organization has to be accurate while forecasting demand and cost conditions, so that the suggested price is accepted by other organizations.

Barometric price leadership takes place due to the following reasons:

a. Lack of capacity and desire of organizations to estimate appropriate supply and demand conditions. This influences organizations to follow price changes made by the barometric organization, which has a proven ability to make correct forecasts.

b. Rivalry among the organizations may make a leader, which can be unacceptable by other organizations. Thus, most of the organizations prefer barometric price leadership.

iii. Aggressive Price Leadership:

Implies a leadership in which one organization establishes its supremacy by threatening the organizations to follow its leadership. In other words, a

dominant organization establishes leadership by following aggressive price policies and forces other/organizations to follow the prices set by it.

Price-Output Determination under Price Leadership:

Price leadership takes place when there is only one dominant organization in the industry, which sets the price and others follow it. Different economists have developed different models for determining price and output in price leadership. Suppose there are two organizations, A and B producing identical products where organization A has a lower cost of the production than organization B. Therefore, consumers are indifferent between these two organizations due to identical products. This implies

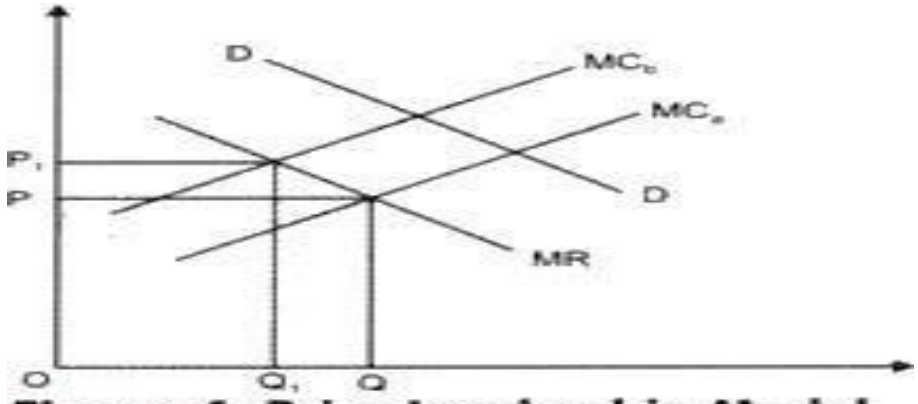


Figure-4: Price Leadership Model

that both the organizations would face same demand curve, which further represents equal market share.

In Figure-4, DD is the demand curve of both the organizations and MR is their marginal revenue. MC_a and MC_b are the marginal cost curves of organization A and B respectively. As stated earlier, the cost of production of organization A is less than B, thus, MC_a is drawn below MC_b.

Let us first start the discussion of price leadership with the case of organization A. The profits of organization A would be maximized at a point where MR intersects MC_a. At this point, the output of organization A would be OQ with the price level OP. On the other hand, the profits of organization B would be maximized at a point where MR intersects MC_b with output OQ_1 and price OP_1. In such a case, the price of organization B is more as compared to organization A. However, both the organizations have to charge the same price as products are homogeneous.

In this case, organization A is the price leader and organization B is the follower.

Thus, organization A will dictate the price to organization B. Both the organizations will follow the same output, OQ and price OP. However, the profits earned by organization B are less than A, as it has to produce at price OP which is less than its profit maximizing price, OP_1. In addition, the organization B also has high costs of production that leads to lower profits at price OP_1.

Drawbacks of Price Leadership:

i. Makes it difficult for the price leader to assess the reactions of followers.

ii. Leads to malpractices, such as charging lower prices by rival organizations in the form of rebates, money back guarantees, after delivery free services, and easy installment facility. The prices charged by rival organizations are comparatively less than the prices set by the price leader.

iii. Leads to non-price competition by rival organizations in the form of aggressive promotion strategies.

iv. Influences new organizations to enter into the industry because of price rise. These new organizations may not follow the leader of the industry.

v. Poses problems if there are differences in cost of price leaders and price followers. In case, if cost of production of price leader is less, then he/she would fix lower prices.

3.9. Basing point price system

This model is an extension of Hotelling's model of non-collusive pricing by duopolists located in different places. Basing-point pricing has been adopted often in practice by oligopolists producing a homogeneous product whose transportation costs are relatively high and whose production requires a large plant if the full economies of scale (minimum production costs) are to be realized. We will examine two varieties of basing-point pricing, the single basing-point system and the multiple basing-point system.

A. The Single Basing-Point System

In this collusive pricing model the oligopolists agree on a common place as the basing point, and all firms quote as their price the production price (mill price) at the basing point, plus transportation cost from the basing point to

the place of destination. Assume that town A is agreed as the basing point for all oligopolists located anywhere. The basing-point production price is AP. Delivered prices increase as the distance from the basing point increases. Assume that the delivered prices change as shown by the curve PT in figure 3.23.

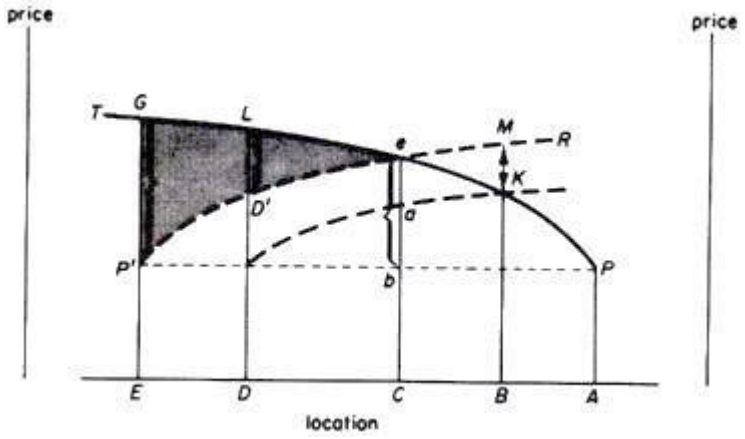


Fig. 3.23

These prices are the same for all oligopolists. For example, a firm located in town E will quote the price EG to its local customers, the price DL to customers in town D, and the price BK to buyers located in town B. Clearly if the production price (mill price) is in town E the same as in the basing point A, the firm in E will be realizing excess profits by selling to buyers located between E and C. For example, if the firm in E sells to a buyer located in D the firm will be making an excess profit equal to D'L per unit of output, since its freight costs are given by the P'R curve. Such excess profits are called 'phantom freight'. The firm in E may expand its sales beyond point e in the territory-market of firms located at A, if its marginal costs are less than its mill price EP' minus the freight it will have to cover. For example, the firm located at E will find it profitable to sell to buyers at B, if its marginal cost is MC < (EP' – KM). The firm located in the basing point A will be covering all its production and transport costs at all places. Thus the oligopolists may find it profitable to sell in each other's territory-markets. This is known as cross-hauling.

B. Multiple Basing-Point System:

The excess profits ('phantom freight' gains) realized by firms selling at the basing-point price to buyers located at places where this price is higher than

their production costs plus transportation cost, may be reduced under a system of multiple basing-point pricing. In such a system several places are agreed as basing points. The delivered price of all oligopolists will be the same for buyers located in a certain place, and will be the lowest-possible delivered price. To illustrate the multiple basing-point system assume that location A and location E are both agreed as basing points. The delivered price of firms in location A are those on the curve PT, the delivered prices of firms located in E are those on curve P'R (figure 3.23). Only at the point of intersection of PT and PR will the delivered price be identical for firms located in A and E. To the left of e the delivered price of firms in A are higher than those of firms located in E thus for buyers located to the left of e the delivered prices quoted by all sellers will be the (lower) prices of curve P'e. To the right of point e the delivered prices of firms in A are lower, and these will be quoted by all firms to all buyers.

In this way the relevant delivered prices for buyers located between E and A are the prices on the segment Fe (of FR) and the segment eP(on PT). A firm located in A will charge the delivered price on P'e to buyers located between E and C, without gaining any 'phantom freight'. If this firm wants to sell to buyers located further than C, it will have to cover itself part of the freight. Only firms in between the basing points will have 'phantom freights', given that they can produce at the same mill price as firms in A or E. For example, a firm located in D will charge the delivered price Ce to buyers located at C, and will receive 'phantom freight' equal to ae. A firm located at C and selling to local customers will receive a greater phantom price (equal to eb) given the two basing- point pricing agreement. It should be clear that as the number of basing points increases the 'phantom freights' are gradually eliminated. In the limit, if sellers were located next to each other and there were as many basing points as sellers, all would quote the same price EP' = AP, which is the lowest of delivered prices of all sellers. The basing-point system reduces competition. If firms adhere strictly (without secret price concessions and other forms of cheating) to the basing-point pricing agreement, price competition is avoided. Identical prices prevail in all locations, and the share of

each oligopolist is determined by chance or by non-price competition (advertising, prompt delivery, differentiated product).

Given that open agreements for basing-point pricing are illegal, trade associations and other similar institutions publish detailed data on freights so as to facilitate the member firms to arrive at the same price for buyers in the same location. The firms usually take as a basis the mill price of a tacitly agreed leader who publishes its mill price regularly, and add to this price the freights published by the trade association. Naturally, there is always the incentive to cheat, and price-chiselling may appear a tentative action. However, in most cases some sort of informal gentlemen's agreement imposes sanctions against firms who are caught not adhering to the basing-point pricing rules. The basing-point pricing system is sometimes called the 'Pittsburgh-plus' pricing system, because it was widely used el industry in the U.S.A. (with Pittsburgh being the basing point) in the 1920s.

3.10. MONOPSONY

Monopsony is a market structure which was first introduced by Joan Robinson in 1933 in her book, "The Economics of Imperfect Competition". She awarded as classics scholar Bertrand Hallward at University of Cambridge for this contribution. Monopsony is a market structure where there is a single buyer and many competing sellers. This market power enables the buyer to purchase the good at less than the price that is prevailing in the competitive market. In order to find equilibrium under monopsony market structure we need to introduce two terms i.e. average expenditure and marginal expenditure. The monopsony is in equilibrium where marginal value is equal to marginal expenditure. In order to understand average expenditure and marginal expenditure concept we are using the concept of competitive buyer. In the market structure we have seen that in order to decide how much of a good to purchase we used the marginal principle rule. Under marginal principle rule, marginal revenue is equal to marginal cost i.e. additional benefit equals additional cost. And demand curve measures the marginal value as a function of quantity purchased. In competitive market, each buyer is so small in terms of a market as a whole that it cannot influence the market. Each individual buyer has no influence on the price of the product and each

buyer can purchase whatever amount he want to buy at the industry determined price. The cost of each unit buyer purchase is equal to the price of the product. The price per unit paid by the buyer is known as average expenditure. The average expenditure remains same for all units as the price per unit paid by the buyer is same. On the other hand, marginal expenditure is the addition to total expenditure attributable to purchase of one more unit of good. In competitive market, average expenditure is equal to marginal expenditure. They both are straight line parallel to horizontal axis. But the same is not true for monopsonist. Under monopsony, the price that a monopsonist pays for each quantity purchased is given by the market supply curve of the inputs. The supply curve for most inputs are positively sloped i.e. upward sloping. The positively sloped supply curve indicates a positive relationship between price and quantity purchased. The curve shows how much price per unit buyers are paying for the good which is a function of the number of units buyers purchase. So, the supply curve is the average expenditure curve. The average expenditure curve like market supply curve is upward sloping. The marginal expenditure must lie below average expenditure curve because the decision to buy an extra unit raises the price that must be paid for all units and not just the extra one. We can obtain marginal expenditure algebraically. Supply curve shows the relationship between price and quantity supplied. So, P = (Q) Total expenditure is price multiplied by quantity i.e. $E = PxQ$

Marginal expenditure is addition to total expenditure attributable to purchase of one more unit of good i.e. $ME = \Delta T. E\ \Delta Q = P(Q) + Q. \Delta P\ \Delta Q$

We know that supply curve is positively sloped, so $\Delta P\ \Delta Q$ is positive so marginal expenditure is greater than average expenditure (ME>AE).

3.11. Bilateral monopoly

Bilateral monopoly is a market structure where the participants are two monopolies i.e. one on the demand side and one on the supply side. It arises when a monopolist (single seller) faces a monopsonist (single buyer). Here both buyers are sellers are in a bargaining position so it is very difficult to predict what the price and output will be. Here we are assuming that firms are organized in such a way that it acts like a monopsony and labor is

organized in a labor union that acts like a monopolist. We know that there is no supply curve for monopoly. It implies that there is no unique relationship between price and quantity supplied. A monopolist is maximizing its profit by selecting a point on his buyer's demand function. On the other hand, there is no input demand function for monopsonist. A monopsonist is maximizing its profit by selecting a point on his seller's supply function. In bilateral monopoly, monopsony power and monopoly power counteract each other. The monopoly power of sellers will reduce the effective monopsony power of buyers and vice versa. The monopolist cannot exploit a demand function that does not exist and the monopsonist cannot exploit the input demand function that does not exist. The three possible solutions under bilateral monopoly are: i. the monopsonist and monopolist may cooperate with each other and achieve a Nash equilibrium solution. ii. Monopolist may dominate and force the monopsonist to accept his price and output decisions or vice versa. iii. The market mechanism may break down such that no trade takes place at all. is a market structure where the participants are two monopolies i.e. one on the demand side and one on the supply side. It arises when a monopolist (single seller) faces a monopsonist (single buyer). Here both buyers are sellers are in a bargaining position so it is very difficult to predict what the price and output will be. Here we are assuming that firms are organized in such a way that it acts like a monopsony and labor is organized in a labor union that acts like a monopolist. We know that there is no supply curve for monopoly. It implies that there is no unique relationship between price and quantity supplied. A monopolist is maximizing its profit by selecting a point on his buyer's demand function. On the other hand, there is no input demand function for monopsonist. A monopsonist is maximizing its profit by selecting a point on his seller's supply function. In bilateral monopoly, monopsony power and monopoly power counteract each other. The monopoly power of sellers will reduce the effective monopsony power of buyers and vice versa. The monopolist cannot exploit a demand function that does not exist and the monopsonist cannot exploit the input demand function that does not exist. The three possible solutions under bilateral monopoly are: i. the monopsonist and monopolist may cooperate with each other and achieve a Nash

equilibrium solution. ii. Monopolist may dominate and force the monopsonist to accept his price and output decisions or vice versa. iii. The market mechanism may break down such that no trade takes place at all.

3.12. WORKABLE COMPETITION

Workable Competition There are four types of market structure that we have covered so far namely perfect competition, monopoly, monopolistic and oligopoly where perfect competition is one extreme and monopoly the other. There are other forms of market likes monopolistic competition, duopoly, oligopoly which lie between perfect competition and monopoly. These market structures are different from perfect competition and monopoly in terms of degree of competition and market power. Now the question that arises here is which market structure to adopt to considering the viewpoints of a business firm and the whole economy. The objective of the business firm is to maximize its profit rather than the welfare. In order to have more profit business firms prefer greater degree of market power. So, a business firm always prefers monopoly market structure. Let us now take the view point of economy as a whole which considers monopoly an inefficient form of market structure. The monopolist equilibrium is allocative inefficient because it does not maximize the sum of producer surplus and consumer surplus. Monopoly which maximizes its profit by producing an output where price is more than marginal cost results in higher prices and lower quantities and makes the firm better off and consumer worse off. The consumer exploitation is maximum in case of monopoly. The next market structure which comes after monopoly in terms of market power is duopoly and oligopoly. Duopoly is a special case of oligopoly where two firms are competiting with each other. Under oligopoly, each firm has enough market power to prevent itself from being a price taker. The duopoly and oligopoly have assured monopoly power to influence the market. Another market structure which may not be preferred either by firm or by the economy as a whole is “monopolistic competition”. Under monopolistic competition, the industry has excess capacity as each firm is not producing at the minimum point on its LAC curve. Here firms are investing in capacity that is not fully utilized. Besides this firms are incurring

huge expenditures on selling cost. In long run, the firm would attain equilibrium when all the firms are earning zero economic profit. Free entry would drive down all the super normal profits to zero. This is because of these inefficiencies; monopolistic competition is not preferred by society as a whole. The only market structure left is perfect competition which is most desirable from the economy as a whole. Perfect competition is a market structure with large number of buyers and sellers, trading homogeneous products so that each seller and buyer is a price taker and not a price maker. But the problem with perfect competitive market structure is that it is not observed in reality. Some of its assumptions such as absence of market restriction, homogeneous products, perfect information about the market etc. are not met in practice. Under perfect competition, each seller is so small that by changing its prices it cannot affect the market as a whole. In the long-run, all firms are earning zero economic profit. Even in the short run, perfect competition operate in the business passively without any market power. Therefore, perfect competition is also an unreal situation. Thus, the instability, discontent and hypothetical nature of perfect competition led to a search for its alternative. The alternative should not deviate from the perfect competition but also provides a workable base for the economy. The workable base for the economy should target economic efficiency.

Workable Competition: The idea of workable competition was first enunciated by economist J.M. Clark in 1940. There is no exact definition of workable competition. Several authors have taken it in terms of fulfillment of certain conditions. According to Clark: " Competition is rivalry in selling goods, in which each selling unit normally seeks maximum net revenue, under conditions such that the price or prices each seller can charge are effectively limited by the free options of the buyer to buy from a rival seller or sellers of what we think of as 'the same' product, necessitating an effort by each seller to equal or exceed the attractiveness of the others offering to a sufficient number of sellers to accomplish the end in view". Clark using this definition makes the concept of workable competition explicit and given three conditions which are:

- A demand curve must be steep enough to enable the entrepreneur to cover per unit cost.
- Active threats of possibility of inter commodity substitution and potential competition.
- In case of small numbers, sufficient non homogeneous products to cause uncertainty about reactions of competitors.

According to Stigler, "an industry is workable competitive when,

- When there are a considerable number of firms selling closely related products in each market area. These firms are not in collusion and
- The long run average cost curve for a new firm is not materially higher than that for an established firm".

According to Edwards, "large number of buyers and sellers, absence of collusion and coercion, free entry and the profit motives are necessary characteristics of workable competition. Bain has defined it as "patterns of market structure and conduct which may be expected to give rise to or associated with workable performance". We have seen that workable competition is a normative concept tied up with the overall objectives in economy. Which form of market structure is relevant for economy is a social policy issue? It is a regulatory mechanism to improve the links between market performance, market conduct and market structure in the most desirable way.

Check Your Progress:

Q.No	Short Questions	LOCF Mapping		
1.	Illustrate the Cournot duopoly model.	K1	CO1	PO1
2.	Distinguish between barometric and aggressive price leadership.	K2	CO2	PO2
3.	State the features of perfect competition.	K2	CO1	PO2
4.	Review the various types of base point price system.	K4	CO2	PO4
5.	Describe the price and output determination under monopsony.	K2	CO4	PO2
Q.No	**Essay Type Questions**	**LOCF Mapping**		
1.	Experiment the Nash equilibrium in the prisoner dilemma.	K3	CO5	PO3
2.	Categorize the different types of collusive oligopoly with examples.	K4	CO2	PO4
3.	Elucidate the diagrammatic representation of Sweezy kinked demand curve model.	K2	CO1	PO2
4.	Elaborately discuss the Cournot duopoly model with examples.	K4	CO1	PO4
5.	Assess diagrammatically the long run equilibrium of the industry under perfect competition.	K5	CO3	PO4

UNIT – IV

ALTERNATIVE THEORIES OF FIRM

4.1. FULL COST PRICING RULE

Hall and Hitch sought information from them about the elasticity and the position of their demand, and their attempts to equate their estimated marginal cost and marginal revenue. The answers revealed that the majority of them apparently made no efforts, even implicitly, to estimate elasticities of demand or marginal cost. They did not consider them to be of any relevance to the pricing process.

On the basis of the empirical study, Hall and Hitch concluded that the majority of entrepreneurs under oligopoly base their selling prices upon, what they call, 'full cost' and including an allowance of profit, and not in terms of the equality of marginal cost and marginal revenue at all. Thus a price based on full average cost is the 'right price', the one which 'ought to be charged', based on the idea of 'fairness to competition' under oligopoly. But what is full cost? Full cost is full average cost which includes average direct costs (AVC) plus average overhead costs (AFC) plus a normal margin for profit: Thus price, P = AVC + AFC + profit margin (usually 10%). According to Hall and Hitch, there are certain reasons which induce firms to follow the full-cost pricing policy:

(i) Tacit or open collusion among producers;

(ii) Failure to know consumers' preferences;

(iii) Reaction of competitors to a change in price;

(iv) Moral conviction of fairness; and

(v) Uncertainty of effects of price increases or decreases. All these reasons prevent oligopolistic producers from setting a price other than the full-cost price.

Thus firms set their price on the basis of the full-cost principle and sell at that price whatever the market takes. They observed that prices were sticky in the oligopoly market despite changes in demand and costs. They explained the stickiness of prices in terms of the kinked demand curve. The kink occurs at the point where the price QP (= OB) fixed on the full-cost principle actually stands in Figure 4.1.

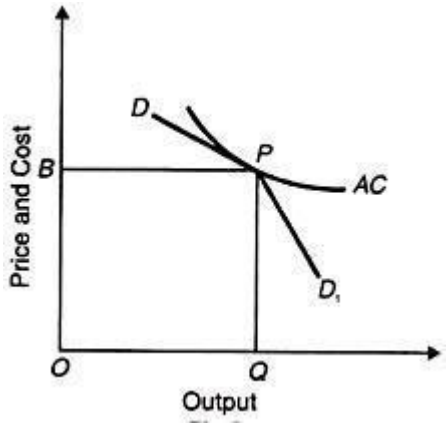


Fig.4.1.

Any increase in the price above it, will reduce the firm's sales, for its competitors will not follow it in raising their prices. This is because the PD portion of the kinked demand curve is elastic. On the other hand, if the firm reduces the price below QP, its competitors will also reduce their prices.

The firm will increase its sales but its profits will be less than before. This is because the PD_1 portion of the curve is less elastic. Thus in both the price-raising and price-reducing situations, the firm will be a loser. It would, therefore, stick to the price QP so long as the prices of the direct factors of production (i.e., raw materials, etc.) remain unchanged.

As the AC curve falls over a large range of output, price varies inversely with output. The smaller the level of output, the higher will be the average cost and the higher the price of the product. But Hall and Hitch rule out the possibility of oligopoly firms producing small outputs and charging higher prices.

They give three reasons for this;

(a) Oligopoly firms prefer price rigidity,

(b) They cannot raise the price because of the kink, and

(c) They want to "keep the plant running as full as possible, giving rise to a general feeling in favour of price concessions".

Hall and Hitch mention two exceptions to this phenomenon of a rigid price:

(i) If the demand decreases much and remains so for some time, the price is likely to be reduced in the hope of maintaining output. This is likely to happen when the lower portion of the demand curve becomes more elastic.

The reason for this price- cut is when one firm becomes panicky and reduces its price; it forces others to cut their prices,

(ii) Any circumstances which lower or raise the AC curves of all firms by similar amounts due to changes in factor prices or technology are likely to lead to a revaluation of the full-cost price QP (= OB). But there is no tendency for prices to fall or rise more than the wage and raw material costs.

The Andrews Version:

The Hall-Hitch explanation is based on the presumption that the price to be charged in the oligopoly market is pre-set by the firm. Further, the kinky demand curve complicates the analysis. In order to simplify the exposition, we give a modified version of the full-cost pricing by Prof. Andrews.

Prof. Andrews in his study Manufacturing Business, 1949, explains how a manufacturing firm actually fixes the selling price of its product on the basis of the full cost or average cost. The firm finds out the average direct costs (AVC) by dividing the current total costs by current total output. These are the average variable costs which are assumed to be constant over a wide range of output.

In other words, the AVC curve is a straight line parallel to the output axis over a part of its length if the prices of direct cost factors are given. The price which a firm will normally quote for a particular product will equal the estimated average direct costs of production plus a costing-margin or mark-up.

The costing-margin will normally tend to cover the costs of the indirect factors of production (inputs) and provide a normal level of net profit, looking at the industry as a whole.

The usual formula for costing-margin (or mark-up) is,

M = P-AVC/AVC.....(1)

Where M is mark-up, P is price and AVC is the average variable cost and the numerator P-AVC is the profit margin. If the cost of a book is Rs. 100 and its price is Rs. 125,

M = 125-100/100 = 0.25 or 25%

If we solve equation (1) for price, the result is

P = AVC (1 + M) ……. (2)

The firm should set the price

P = Rs. 100 (1 + 0.25) = Rs. 125.

Once this price is chosen by the firm, the costing-margin will remain constant given its organisation, whatever the level of its output. But it will tend to change with any general permanent changes in the prices of the indirect factors of production.

Depending upon the firm's capacity and given the prices of the direct factors of production (i.e., wages and raw materials), price will tend to remain unchanged, whatever the level of output. At that price, the firm will have a more or less clearly defined market and will sell the amount which its customers demand from it.

But how is the level of output determined?

It is determined in any of the three ways:

(a) As a percentage of capacity output; or

(b) As the output sold in the preceding production period; or

(c) As the minimum or average output that the firm expects to sell in the future.

If the firm is a new one, or if it is an existing firm introducing a new product, then only the first and third of these interpretations will be relevant. In these circumstances, indeed, it is likely that the first will coincide roughly with the third, for the capacity of the plant will depend on expected future sales.

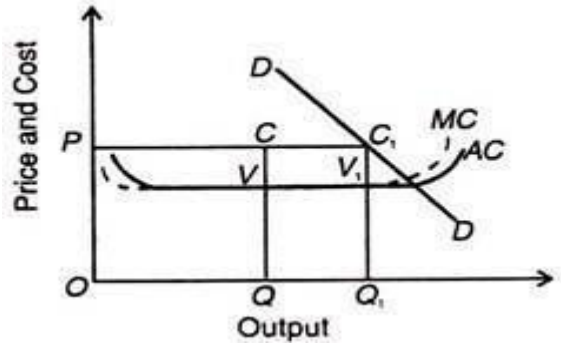


Fig.4.2.

The Andrews version of full-cost pricing is illustrated in Figure 4.2 where AC is the average variable or direct costs curve which is shown as a

horizontal straight line over a wide range of output. MC is its corresponding marginal cost curve.

Suppose the firm chooses OQ level of output. At this level of output, QC is the full-cost of the firm made up of average direct costs QV plus the costing-margin VC. Its selling price OP will, therefore, equal QC.

The firm will continue to charge the same price OP but it might sell fig. 4 .2 more depending upon the demand for its product, as represented by the curve DD. In this situation, it will sell OQ_1 output. This price will not be altered in response to changes in demand, but only in response to changes in the prices of the direct and indirect factors.

Criticism:

The full-cost pricing theory has been severely criticised on the following grounds:

(1) Not free from profit maximisation:

Critics like Robinson and Kahn have pointed out that the full-cost pricing theory is not free from the elements of profits maximisation which entered into the pricing decisions of many of the firms investigated by Hall and Hitch.

(2) Whose full cost?

One of the weaknesses of the theory is that it fails to point out the firm whose full cost will determine the price in the oligopoly market that will be followed by the other firms.

(3) Firms follow Independent price policy:

The full-cost pricing theory is criticised for its adherence to a rigid price. Firms often lower the price to clear their stocks during a recession. They also raise the price when costs rise during a boom. Therefore, firms often follow an independent price policy rather than a rigid price policy.

(4) Circular relationship:

If fixed costs of a firm form a large proportion of its total cost, a circular relationship may arise in which the price would rise in a falling market and fall in an expanding market. This happens because average fixed cost per unit of output is low when output is large, and when it is small, average fixed cost per unit of output is low.

(5) Profit margin a vague concept:

Moreover, the term 'profit margin' or 'costing margin' is vague. The theory does not clarify how this costing margin is determined and charged in the full cost by a firm. The firm may charge more or less as the just profit margin depending on its cost and demand conditions.

As pointed out by Hawkins, "The bulk of the evidence suggests that the size of the 'plus' margin varies: it grows in boom times and it varies with elasticity of demand and barriers to entry."

(6) Naive method:

This pricing method is naive because it does not explicitly take into account the elasticity of demand. In fact, where the price elasticity of demand for a product is low, the cost plus price may be too low, and vice versa.

(7) Not for perishable goods:

This method cannot be used for price determination of perishable goods because it relates to the long period.

(8) Full-cost pricing principle not strictly followed:

Empirical studies in England and the U.S. on the pricing process of industries reveal that the exact methods followed by firms do not adhere strictly to the full- cost principle. The calculation of both of average cost and the margin is a much less mechanical process than is usually thought. As a matter of fact, businessmen are reluctant to tell economists how they calculated prices and to discuss their relations with rival firms so as not to endanger their long-run profits or to avoid government intervention and maintain good public image.

(9) Firms follow marginal principles;

Prof. Earley's study of the 'excellently managed companies in the U.S. does not support the principle of full-cost pricing. Earley found a widespread distrust of full-cost principle among these firms. He reported that the firms followed marginal accounting and costing principles, and the majority of them followed pricing, marketing and new product policies.

4.2. BAINS LIMIT PRICE THEORY

Bain formulated his 'limit-price' theory in an article published in 1949, several years before his major work Barriers to New Competition which was published in 1956. His aim in his early article was to explain why firms over a long period of time were keeping their price at a level of demand where the elasticity was below unity, that is, they did not charge the price which would maximize their revenue.

His conclusion was that the traditional theory was unable to explain this empirical fact due to the omission from the pricing decision of an important factor, namely the threat of potential entry. Traditional theory was concerned only with actual entry, which resulted in the long-run equilibrium of the firm and the industry (where P = LAC).

However, the price, Bain argued, did not fall to the level of LAC in the long run because of the existence of barriers to entry, while at the same time price was not set at the level compatible with profit maximization because of the threat of potential entry. Actually he maintained that price was set at a level above the LAC (= pure competition price) and below the monopoly price (the price where MC = MR and short-run profits are maximized).

This behaviour can be explained by assuming that there are barriers to entry, and that the existing firms do not set the monopoly price but the 'limit price', that is, the highest price which the established firms believe they can charge without inducing entry. Bain, in his 1949 article, develops two models of price setting in oligopolistic markets.

Assumptions:

1. There is a determinate long-run demand curve for industry output, which is unaffected by price adjustments of sellers or by entry. Hence the market marginal revenue curve is determinate. The long-run industry-demand curve shows the expected sales at different prices maintained over long periods.
2. There is effective collusion among the established oligopolists.
3. The established firms can compute a limit price, below which entry will not occur.

The level at which the limit price will be set depends:

(a) On the estimation of costs of the potential entrant,

(b) On the market elasticity of demand

(c) On the shape and level of the LAC,

(d) On the size of the market,

(e) On the number of firms in the industry.

4. Above the limit price, entry is attracted and there is considerable uncertainty concerning the sales of the established firms (post entry).

5. The established firms seek the maximization of their own long-run profit.

Model A: there is no collusion with the new entrant:

Assume that the market demand is DABD' and the corresponding marginal revenue is Dabm (figure 4.3).

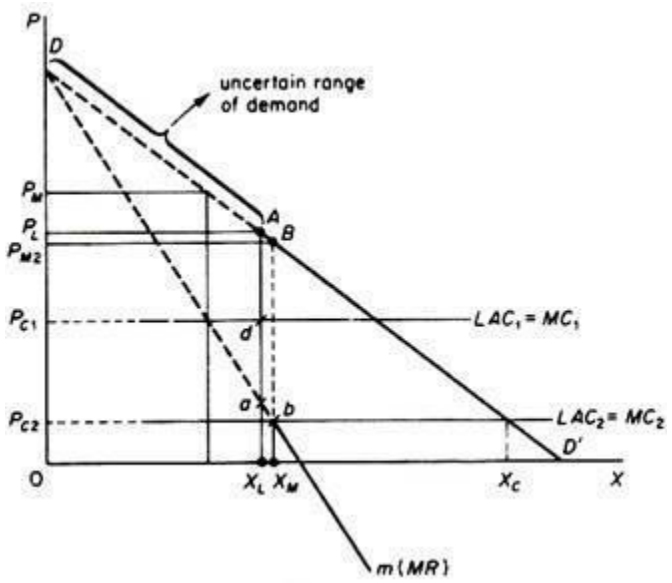


Fig.4.3

Assume further that the limit price (P_L) is correctly calculated (and known both to the existing firms and to the potential entrants). Given P_L, only the part AD' of the demand curve and the section am of the MR are certain for the firms. The part to the left of A, that is, DA is uncertain, because the behaviour of the entrant is not known. Whether the firms will charge the P_L or not depends on the profitability of alternatives open to them, given their costs. Assume the LAC (which is uniquely determined by the addition of the LMC = LAC of the collusive oligopolists) is LAC_1. In this case two

alternatives are possible. Either to charge the P_L (and realise the profit P_LAdP_{c1} with certainty).

Or to charge the monopoly price, that is, the price that corresponds to the intersection of $LAC_1 = MC_1$ with the MR. This price will be higher than P_L (given LAC_1), but its precise level is uncertain post-entry. Thus the profits in the second alternative are uncertain and must be risk-discounted. The firm will compare the certain profits from charging P_L with the heavily risk-discounted profits from the second 'gamble' alternative, and will choose the price (P_L or P_M) that yields the greatest total profits.

Assume that the LAC is $LAC_2 = MC_2$. In this case the price that maximises profit is P_{M2} (corresponding to the intersection MC_2 and MR over the certain range of the latter). The P_{M2} is lower than P_L. The firm will clearly charge P_{M2} which maximises the profits. In this case the ceiling set by the price P_L is not operative. The observed fact of setting the price at a level where $e < 1$ is justified by a situation where the limit price is low, cutting the demand curve at a point at which the MR is negative (figure 4.4). Clearly if the limit price is P_L^* the MR is b* which is negative and hence the elasticity of demand at price P_L is less than unity.

In summary: given that an entry-preventing price P_L is defined, the alternatives open to the established firms are three:

1. To charge a price equal to P_L and prevent entry.

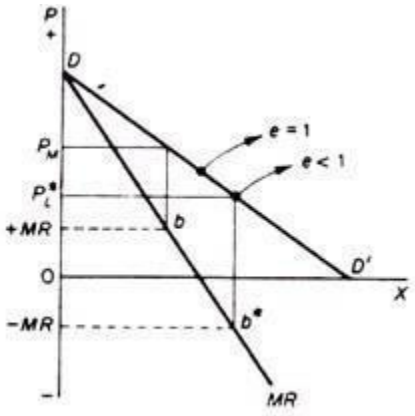


Fig.4.4

2. To charge a price below P_L and prevent entry (this will be adopted if $P_M < P_L$).

3. To charge a price above P_L and take the risks associated with the ensuing entry and the indeterminate situation that arises in the post-entry period. (This course of action will be in any case adopted if P_L < LAC).

The firm will choose the alternative which maximises profit.

Model B: collusion takes place with the new entrant:

With collusion assumed to take place between the established firms and the entrant the conclusions are as before. The model is easier, however. With collusion the whole D curve shifts to the left by the share which is allocated to the new entrant at each price. The new DD" curve is known with certainty at all its points, as a consequence of the collusion, and so is the corresponding m" (figure 4.5).

Again the alternatives open to the firm are three:

1. Either charge P_L and exploit AD' without entry.

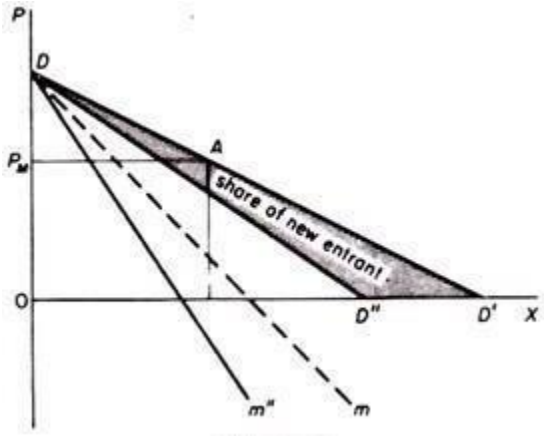


Fig.4.5

2. Or charge a price above P_L and attract entry. The firm will eventually move to a point on the share-of-the-market curve DD", via collusive agreement with the new entrant.

3. Or charge the profit-maximizing price P_M, if P_M < P_L.

Among these alternatives the firm will choose the one that yields maximum profits. The basic and crucial assumptions of the above analysis are firstly, that the entrants react on the basis of the current price they expect the price charged by the established firms to continue in the post-entry period; secondly, that the established firms are aware of the threat of potential entry; thirdly, that the established firms can estimate correctly the limit price.

Then three major possibilities exist:

- The policy of pricing to maximize industry profit with no entry resulting is adopted when $P_L > P_M$, i.e. the limit price is not operative because by charging the lower P_M Price (monopoly price corresponding to MC = MR) profits (certain in this case) are maximized.
- Pricing to forestall entry with industry profits not maximized, but the profit of established sellers maximized, is adopted when $P_L < P_M$ and the certain profit accruing by charging P_L is greater than the heavily risk-discounted profit which would accrue if the higher P_M were charged and an uncertain quantity sold.
- Pricing to maximize industry profit but with resulting entry. This implies $P_M > P_L$. This action would be chosen if it is more profitable as compared with charging P_L and necessarily, if $P_L <$ LAC.
- The first two situations lead to long-run equilibrium of the industry without entry or exit. The third case implies an unstable equilibrium since entry would be taking place.
- In all the above cases one should add to the profits of established sellers any transitional profit which the established sellers might gain while raising the price above P_L and before entry became effective.
- The new element of Bain's model is the redrawing of the market demand so as to account for the threat of entry. Once the demand is redefined, the model accepts collusion and profit maximisation as valid hypotheses, capable of explaining the policy of setting a price below the monopoly level, that is, below the level that maximises profit. Bain's model is not incompatible with profit maximisation.
- The limit price will be chosen in favour of monopoly price if the former yields maximum long-run profits. The rationale of adopting an entry-prevention policy is profit maximisation. Whenever such a limit price is adopted it is implied that the firm has done all the relevant calculations of profits of alternative policies and has adopted the limit price because this yields maximum profits.

4.3. SYLOS – LABINI MODEL

Sylos-Labini developed a model of limit-pricing based on scale-barriers to entry. His model is clumsy, due to its unnecessarily stringent assumptions and the use of arithmetical examples. However, his analysis of the economies-of-scale barrier is more thorough than that of Bain. He highlighted the determinants of the limit price and discussed their implications, thus providing the basis for Modigliani's more general model of entry-preventing pricing. Sylos-Labini concentrated his analysis on the case of a homogeneous oligopoly whose technology is characterised by technical discontinuities and economies of scale.

Assumptions:

1. The market demand is given and has unitary elasticity. The product is homogeneous and will be sold at a unique equilibrium price.

2. The technology consists of three types of plant a small plant with a capacity of 100 units of output; a medium-size plant with a capacity of 1000 units of output; a large-size plant with a capacity of 8000 units of output. Each firm can expand by multiples of its initial plant size only. That is, a small firm may expand by installing another small plant a medium firm may expand by setting up a second medium-size plant, and so on. There are economies of scale cost decreases as the size of the plant increases. However, with this rigid technology we cannot construct a continuous LRAC curve. We have three cost lines corresponding to the three plant sizes (figure 4.6).

3. The price is set by the price leader who is the largest firm, with the lowest cost (ex - hypothesis) at a level low enough to prevent entry. The smaller firms are price-takers. Each one individually cannot affect the

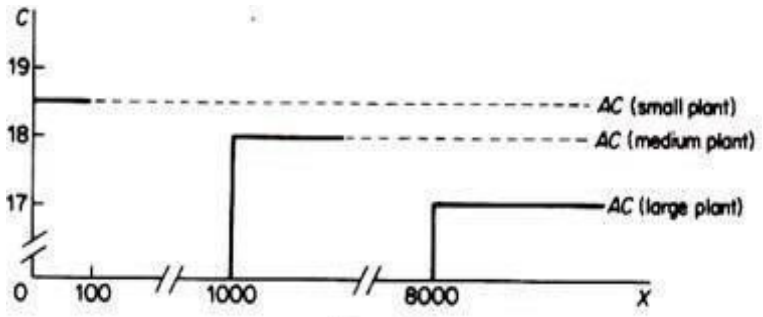


Fig.4.6.

price. However, collectively they may put pressure on the leader by regulating their output. Thus the largest firm does not have unlimited discretion in setting the price it must set a price that is acceptable to all the firms in the industry as well as preventing entry.

4. There is a normal rate of profit in each industry. (Sylos, in his example, assumed that the rate of normal profit is 5 per cent.)

5. The leader is assumed to know the cost structure of all plant sizes, and the market demand.

6. The entrant is assumed to come into the industry with the smallest plant size.

7. The established firms and the entrant behave according to what Modigliani called the 'Sylos's Postulate'. This includes two behavioural rules, one describing the expectations of the established firms and the other the expectations of the entrant. Firstly, the existing firms expect that the potential entrant will not come into the market if he thinks that the price post-entry will fall below his LAC.

Secondly, the entrant expects that the established firms will continue in the post-entry period to produce the same level of output as pre-entry. Under these assumptions, as entry takes place the market price falls and the whole of the resulting increase in the quantity demanded accrues to the new entrant. Clearly this is the same as Bain's Model B. Sylos does not give any reason for this behavioural pattern. The rationalization of the Sylos's postulate has been discussed by subsequent writers.

The model:

Sylos-Labini presents his model with a numerical example. He starts with the market structure shown in table 14.1 which is assumed to be created at random, and proceeds to examine how equilibrium is attained in this market. The equilibrium at price 20 is not stable, because the market output is too small and the price is too high, so entry will take place.

Table 14.1 Initial market structure

Plant size	*Capacity (units of X)*	*Number of firms*	*Total output X*	*Initial price (arbitrary units)*	*Market demand (value)*
Small (X_s)	$X_s = 100$	20	2000	20	40,000
Medium (X_m)	$X_m = 1000$	2	2000	20	40,000
Large (X_l)	$X_l = 8000$	1	8000	20	160,000
Total market		23	12,000		240,000

This is due to the fact that, given the cost structure of the three plants in the industry (see table 14.2), the profits are too high for all firms at the price of 20. From table 14.2 it is apparent that the profit rate of the small firms is 8.1 per cent of the medium firms 11.1 per cent and of the large firms 17-6 per cent. These rates are higher than the minimum profit rate (normal profit) of the industry which is assumed to be 5 per cent. The excess profits will attract entry. Under the above rigid assumptions regarding technology, the possibility of expansion of the existing firms by multiples of their initial plant size and the unitary elasticity of demand, the following results emerge.

Table 14.2 Cost structure of firms, with the assumed technology

Plant size	*Capacity output*	TFC	AFC	TVC	AVC	TC	ATC	*Profit rate % on* ATC	*Unit profit*	*Price*	*Total revenue*
Small firm	100	100	1	1750	17·5	1850	18·5	8·1	1·5	20·0	2000
								5.4	1·0	19·5	1950
								5·0	0·9	**19·4**	1940
Medium firm	1000	2000	2	16,000	16	18,000	18	11·1	2·0	20·0	20,000
								8·3	1·5	19·5	19,500
								7·8	1·4	19·4	19,400
								6·7	1·2	19·2	19,200
								5·0	0·9	**18·9**	18,900
Large firm	8000	24,000	3	112,000	14	136,000	17	17·6	3·0	20·0	160,000
								14·7	2·5	19·5	156,000
								14·1	2·4	19·4	155,200
								12·9	2·2	19·2	153,600
								5·0	0·85	**17·85**	142,800

No new large firm will enter into the industry. If it did, total sales would rise to 20,000 units and the price would fall to 12, a level lower than the minimum acceptable price to any firm in the industry. From table 14.2 we can see that the minimum acceptable prices for the three plant sizes are

19-4 (for the small plant), 18-9 (for the medium size plant) and 17-85 (for the large scale plant).

Even the entry of a new medium-size firm is precluded given the costs and the demand in the industry. If a medium-size plant were installed sales would increase to 13,000 units, and the price would fall to 18-4, which is not acceptable by the small and the medium- size firms.

However, up to three small firms can enter the market. Their entry would cause sales to rise to 12,300 units and the price to fall to 19-5, which exceeds the minimum acceptable price of all firms. The entry of a fourth small firm would depress the price to 19-3, a level below the minimum acceptable price (of 19-4) of the small firms.

Thus the entry-forestalling price is just above the minimum acceptable level of the smallest, least efficient firms.

The above results regarding the entry conditions under the given cost and demand conditions are shown in table 14.3. The computations are based on the assumption that the demand has unitary elasticity so that the total expenditure is the same (equal to the initial level of 240,000) at all prices.

Table 14.3 Prices and level of output yielding a total expenditure of 240,000

Output X	*Price* P	*Total expenditure* R = XP (e = 1)
12,000	20·0	240,000
12,100	19·8	240,000
12,200	19·6	240,000
12,300	19·5	240,000
12,400	19·3	240,000
12,500	19·2	240,000
12,770	18·8	240,000
13,000	18·4	240,000
18,000	13·3	240,000
20,000	12·0	240,000

Price determination:

We said that the price is set by the largest, most efficient firm. The equilibrium price must be acceptable by all the firms in the industry, and should be at a level which would prevent entry. Given that firms have different costs, there are as many minimum acceptable prices as plant sizes. For each plant the minimum acceptable price is defined on the average-cost principle.

$P_i = TAC_i(1 + r)$

where P_t = the minimum acceptable price for the ith plant size

TAC_i = total average cost for the ith plant size

r = normal profit rate of the industry

The minimum acceptable price covers the TAC of the plant and the normal (minimum) profit rate of the industry (in Sylos example r = 5 per cent for all plant sizes, that is, the normal profit of the industry is 5 per cent). The price leader is assumed to know the cost structure of all plant sizes and the normal (minimum) profit rate of the industry. Given this information the leader will set the price that is acceptable by the smallest, least efficient firms, and will deter entry.

The price tends to settle at a level immediately above the entry preventing price of the least efficient firms, which it is to the advantage of the largest and most efficient firms to let live. The price leader, which is the most efficient firm, will set the price at a level acceptable to all existing firms and low enough to forestall entry. Entry takes place with the minimum plant scale which has the highest cost.

In Sylos's model, where differential costs are assumed, the price, in order to be a long-run equilibrium one, apart from preventing entry must also be acceptable by the least efficient firms, allowing them to earn at least the normal industry profit given that the most efficient firm (leader) does not find it worthwhile to eliminate the smaller firms, either because such action is not profitable or because the leader is afraid of attracting government intervention due to high concentration in the industry.

Clearly the medium and large-scale firms, having lower costs, will be earning abnormal profits. But small firms will also normally be earning some abnormal profits without attracting entry. Given the market demand at the minimum acceptable price of the smallest least efficient firm (and given that at that price all established firms work their plants to full capacity), the price leader will set the price at such a level, that, if the entrant decides to enter, the market price will fall below his minimum acceptable price (which is the same as the minimum acceptable price of the smallest, least efficient plant size).

In figure 14.2 the market demand at the minimum acceptable price P_s of the smallest, least efficient, firm is X. The leader will set the limit price $P_L > P_s$. The price P_L corresponds to the level of output $X_L = X - X_s$ and is the equilibrium price because it satisfies the two necessary conditions: it is acceptable by all firms, and it deters entry, because if entry occurs the total output X_L will be increased at the level $X_L + X_s = X$ and the price will fall to (just below) the minimum acceptable price of the entrant, that is, to a level just below P_s.

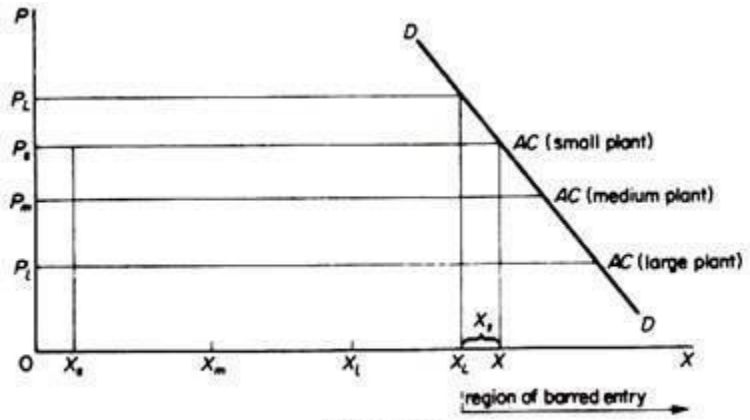


Figure 14.2

The P_L is indirectly determined by the determination of the total output that the established firms will sell in the market. Given that in the long run price cannot fall below the cost of the least efficient firm, and that the entrant can enter only with the smallest least- efficient plant size, the leader can determine the output X at which all established firms use their plants up to capacity. He next determines the total quantity that the firms will sell in the industry X_L so as to prevent entry.

X_L is such that if the entrant comes into the market with the minimum viable size, X_s, the total post-entry output ($X_L + X_s$) will just exceed X, and hence will drive price down to a level just below the AC of the entrant (= AC of the small least-efficient firms). Given X_L, the limit price P_L is determined from the market-demand curve DD. The entrant will be deterred from entering the market because (under the Sylos's Postulate) he knows that if he enters he will cause the price to fall below his AC. Any output larger than X_L is entry-preventing, while any output smaller than X_L will not prevent entry.

It should be clear that in Sylos's model all firms earn abnormal profits, which are increasing with plant size and there is an upper and a lower limit of the entry-preventing price: the equilibrium price cannot be higher than P_L nor lower than P_s.

In Sylos's model the determinants of the entry-preventing price are:

(1) The absolute size of the market X.

(2) The elasticity of market demand.

(3) The technology of the industry, which defines the available sizes of plant.

(4) The prices of factors of production, which, together with the technology, determine the total average cost of the firms.

The absolute market size:

There is a negative relationship between the absolute size of the market and the limit price. The larger the market size the lower the entry prevention price. If there is a dynamic increase in the demand, denoted by a shift to the right of the industry-demand curve, the effect on the price and the structure of the industry depends on the size and the rate of increase.

If the increase in demand is considerable and occurs rapidly, the existing firms, if they want to prevent entry, must lower the price (or set a lower price initially, in anticipation of the developments on the demand side) and build up additional capacity to meet the demand (or have adequate foresight so as to keep a continuous reserve capacity).

If the price is high and profits lucrative, and if the established firms cannot build up capacity fast enough to keep up with the rate of growth in demand, then entry from new firms or already established firms in other industries will take place. If we relax the restrictive assumption that the entrant will enter with the smallest optimal plant size, and accept that large firms from other industries manage to enter at a lower cost, some or all of the small firms will be eliminated, and price will fall.

Thus a rapid increase in the absolute market size will tend to reduce price and increase the average plant size in the industry, unless the existing firms can keep their shares constant by keeping continuously adequate reserve capacity. This policy, however, may be very costly. Thus in fast-

expanding industries entry is almost certain to occur and price will be reduced. If the growth of demand is slow, the existing firms will most probably be able to meet the increased demand by appropriate reserve capacity and gradual new investment, and the price will not be reduced unless new techniques with lower costs can be adopted for the larger scales of output to which the established firms are gradually led.

The elasticity of market demand:

The elasticity of market demand is also negatively related to the limit price. The more elastic the demand is, the lower the price that established firms can charge without attracting entry. If at the going price there is a considerable increase in the elasticity of demand (for price reductions), and if the firms are able to identify clearly this change in the elasticity of demand, the effects on price and on market structure are the same as in the case of a shift in the market demand.

The detection of changes in the elasticity is almost impossibly difficult in practice, and the established firms will most probably not count (and plan ahead) on such uncertain changes in e. Thus if e does in fact change substantially, new large firms (established elsewhere) will enter into the market, since the existing firms will not be able to cope with such change, and the price will fall.

The Technology and Technical Change:

The technology determines the minimum viable plant size. In any given 'state of arts,' the larger the minimum viable plant size, the higher will be the limit price. Thus there is a positive relation between the minimum viable plant and the premium included in the limit price.

If technology changes (technical progress) and benefits all plant sizes, costs will fall and price will decrease. However, if technical progress is such that only large firms have access to it, the limit price will not change. The large firms will have larger actual profits, but under the assumptions of Sylos's model the price need not change. If technical progress is associated with product innovation (rather than process innovation) the price in the market will not normally be affected. One should expect an intensification

of non-price competition as all firms in the industry will attempt to imitate the innovation.

Sylos seems to imply that technical progress is accessible only to the large firms who can afford large research and development departments. He argues that in the real world the large firms will not have any incentive to lower the price of their commodities despite the reduction in their costs. Under these conditions the large firms will realise higher profits and this will have serious implications for the distribution of income and employment. This argument is elaborated in the second part of Sylos's book. However, we will not deal with these macro-aspects of Sylos's theory.

The Prices of Factors of Production:

Changes in factor prices affect all the firms in the industry in the same way. Thus an increase in factor prices will lead to an increase in the costs and the limit price in the industry. Similarly a reduction in factor prices will lead to a decrease in the limit price.

Differentiated oligopoly:

Sylos extended his analysis to the case of differentiated oligopoly. Sylos argues that when the products are differentiated the entry-barriers will be stronger than in the case of homogeneous oligopoly due to marketing economies of scale. He seems to accept that advertising unit costs and possibly the cost of raw materials per unit of output are likely to fall as the scale of output increases. Hence the overall cost difference between the smaller and larger plants will be greater as compared to the homogeneous oligopoly case. Product differentiation, therefore, will reinforce the scale-barrier.

Sylos's analysis of differentiated oligopoly lacks the rigour of his model of homogeneous oligopoly. He suggests, however, that he is primarily concerned with the implications of technological discontinuities for price and output, and that product differentiation is one of the main concerns of the 'theoreticians of imperfect competition' to whose analysis Sylos's work is complementary.

4.4. MODIGLIANIS MODELS

MM Theory is the Modigliani-Miller Theory. As the name suggests, it was derived by two people named Modigliani and Miller. Franco Modigliani and Merton Miller were economists whose work set a great milestone in corporate finance theory. The MM Theory in corporate taxes is considered a great milestone in the finance sector. In the MM Theory, the firm's value does not depend on the dividend policy. The value also does not depend on whether or not the firm raises capital by selling the debt or issuing stocks. Another name for the Modigliani-Miller Theory is the capital structure irrelevance principle. It is based on the reasons stated above.

Modigliani was awarded the Nobel Prize for Economics in the year 1985. His other contributions also factored into his Nobel Prize. Merton Miller was a professor of economics at the University of Chicago. Five years after Modigliani received the Nobel Prize, Miller was also awarded a Nobel Prize in economics in 1990. He received the Nobel Prize along with William Sharpe and Harry Markowitz.

The Theorem

The MM Theory is stated for two firms that are exactly similar to each other except for their financial structures. Their financial structures differ from each other. Let's call it firm U, one of the firms is only financed by equity and is unleveled. The second firm, let's call it firm L, is levered. Debts finance it to some extent, and the rest of the finance is brought in by equity.

According to the Modigliani-Miller Theory, the enterprise value of firm U and firm L are the same. However, this value should not be confused with the equity values of the firm.

Assumptions of MM Theory

Let's understand the Assumptions of the MM Theory.

1. Under the MM Theory, the implication of tax is not present
2. All the transaction cost and bankruptcy cost is zero in the MM Theory
3. The investors and the corporation will get the same details and information
4. Based on this information, investors make decisions
5. The borrowing cost will be the same for both corporations and investors

6. Floatation cost is not present
7. Dividend tax on the corporation is not present
8. MM Theory in Corporate Taxes
9. MM Theory plays an essential role in explaining corporate taxes.
10. Propositions of the MM Theory without taxes

The Modigliani-Miller Theory is presented in the form of two propositions.

First proposition

The first proposition of the MM Theory states that the V(U) is the value of an unlevered firm equal to the firm's buying price, which only constitutes equity. The V(L) is the firm's value, which is levered, and the buying price is a mix composed of the equities and debts. The levered firm is also called the geared firm. The MM Theory states that:

V(U) = V(L)

Explanation

Consider that an investor wants to buy one of the two firms, the U firm or the L firm. Instead of buying all the shares of firm L, which is levered, he could buy some shares of firm U and borrow the amount of money the same as the L firm does. The returns on both of these investments would remain the same. Hence, the price of L must be equal to the price of firm U after subtracting the money borrowed. This money is equal to the amount of firm L's debt.

Second proposition

The second proposition of the Modigliani-Miller Theory is a little more complicated. It states that the cost of equity of the leveraged firm equals the sum of the cost of equity of a firm with no leverage, the cost of debt and the debt to equity ratio. The first, and the second propositions hold under the following conditions.

1) There is no cost for the transaction
2) The corporations and individual buyers buy at the same rates
3) However, none of these conditions is satisfied in the real world. So, the results of these propositions aren't practically applied anywhere. But this theorem conveys a very important thing. It conveys that the practical structure matters because one or more conditions are violated. It shows us the places to look for determinants of optimal capital

structure. It also tells us how the optimal structure is affected by various factors.

4) The basic concept covered in the first proposition is that the company's value is not impacted by its capital structure.

Conclusion

MM Theory is essential in the economic field as it states what factors affect the optimal capital structure and how they affect it. Modigliani and Miller proposed the MM Theory. Both of them won Noble prizes in the economy for this contribution. Modigliani won the Nobel in 1985, and Miller won in 1990. The MM Theory suggests that two firms, one of which is levered and the other one is unlevered, will have the same enterprise value and will return the same returns on investment after some time. However, this value isn't the same as the firm's equity.

4.5. INPUT OUTPUT MODEL

Input-output is a novel technique invented by Professor Wassily W. Leontief in 1951. It is used to analyse inter-industry relationship in order to understand the inter-dependencies and complexities of the economy and thus the conditions for maintaining equilibrium between supply and demand. Thus it is a technique to explain the general equilibrium of the economy. It is also known as "inter-industry analysis". Before analysing the input-output method, let us understand the meaning of the terms, "input" and "output". According to Professor J.R. Hicks, an input is "something which is bought for the enterprise" while an output is "something which is sold by it." An input is obtained but an output is produced. Thus input represents the expenditure of the firm, and output its receipts. The sum of the money values of inputs is the total cost of a firm and the sum of the money values of the output is its total revenue. The input-output analysis tells us that there are industrial interrelationships and inter-dependencies in the economic system as a whole. The inputs of one industry are the outputs of another industry and vice versa, so that ultimately their mutual relationships lead to equilibrium between supply and demand in the economy as a whole.

Coal is an input for steel industry and steel is an input for coal industry, though both are the outputs of their respective industries. A major part of economic activity consists in producing intermediate goods (inputs) for further use in producing final goods (outputs).

There are flows of goods in "whirlpools and cross currents" between different industries. The supply side consists of large inter-industry flows of intermediate products and the demand side of the final goods. In essence, the input-output analysis implies that in equilibrium, the money value of aggregate output of the whole economy must equal the sum of the money values of inter-industry inputs and the sum of the money values of inter-industry outputs.

The input-output analysis is the finest variant of general equilibrium. As such, it has three main elements; Firstly, the input-output analysis concentrates on an economy which is in equilibrium. Secondly, it does not concern itself with the demand analysis. It deals exclusively with technical problems of production. Lastly, it is based on empirical investigation. The input-output analysis consists of two parts: the construction of the input-output table and the use of input-output model.

The input-output model relates to the economy as a whole in a particular year. It shows the values of the flows of goods and services between different productive sectors especially inter-industry flows.

Assumptions:

This analysis is based on the following assumptions:

(i) The whole economy is divided into two sectors—"inter-industry sectors" and "final-demand sectors," both being capable of sub-sectoral division.

(ii) The total output of any inter-industry sector is generally capable of being used as inputs by other inter-industry sectors, by itself and by final demand sectors.

(iii) No two products are produced jointly. Each industry produces only one homogeneous product.

(iv) Prices, consumer demands and factor supplies are given.

(v) There are constant returns to scale.

(vi) There are no external economies and diseconomies of production.

(vii) The combinations of inputs are employed in rigidly fixed proportions. The inputs remain in constant proportion to the level of output. It implies that there is no substitution between different materials and no technological progress. There are fixed input coefficients of production.

Explanation:

For understanding, a three-sector economy is taken in which there are two inter-industry sectors, agriculture and industry, and one final demand sector. Table 1 provides a simplified picture of such economy in which the total output of the industrial, agricultural and household sectors is set in rows (to be read horizontally) and has been divided into the agricultural, industrial and final demand sectors. The inputs of these sectors are set in columns. The first row total shows that altogether the agricultural output is valued at Rs. 300 crores per year.

Of this total, Rs. 100 crores go directly to final consumption (demand), that is, household and government, as shown in the third column of the first row.

Table 1 : Input-Output Table

(In value terms) (Rs. Crores)

		Purchasing Sectors			
	Sectors	*1 Inputs to Agriculture*	*2 Inputs to Industry*	*3 Final Demand*	*Total Output or Total Revenue*
Selling Sectors	Agriculture	50	150	100	300
	Industry	100	250	150	500
	Value added*	150	100	0	250
	Total input or Total Cost	300	500	250	1050

The remaining output from agriculture goes as inputs: 50 to itself and 150 to industry. Similarly, the second row shows the distribution of total output of the industrial sector valued at Rs. 500 crores per year. Columns 1, 2 and 3 show that 100 units of manufactured goods go as inputs to agriculture, 250 to industry itself and 150 for final consumption to the household sector.

Let us take the columns (to be read downwards). The first column describes the input or cost structure of the agricultural industry. Agricultural output valued at Rs. 300 crores is produced with the use of agricultural goods worth Rs. 50, manufactured goods worth Rs. 100 and labour or/and management services valued at Rs. 150. To put it differently, it costs Rs. 300 crores to get revenue of Rs. 300 crores from the agricultural sector. Similarly, the second

column explains the input structure of the industrial sector (i.e., 150 + 250 + 100 = 500).

Thus "a column gives one point on the production function of the corresponding industry." The 'final demand' column shows what is available for consumption and government expenditure. The third row corresponding to this column has been shown as zero. This means that the household sector is simply a spending (consuming) sector that does not sell anything to itself. In other words, labour is not directly consumed.

There are two types of relationships which indicate and determine the manner in which an economy behaves and assumes a certain pattern of flows of resources.

They are:

(a) The internal stability or balance of each sector of the economy, and

(b) The external stability of each sector or intersectoral relationships. Professor Leontief calls them the "fundamental relationships of balance and structure." When expressed mathematically they are known as the "balance equations' and the "structural equations".

If the total output of say X. of the 'ith' industry is divided into various numbers of industries 1, 2, 3, n, then we have the balance equation:

$X_1 = x_{i1} + x_{i2} + x_{i3} + x_{in}..... + D_1$

and if the amount say У. absorbed by the "outside sector" is also taken into consideration, the balance equation of the i^{th} industry becomes

It is to be noted that Y_i stands for the sum of the flows of the products of the ith industry to consumption, investment and exports net of imports, etc. It is

$$X_i = x_{i1} + x_{i2} + x_{i3} + ...x_{in} + D_i + Y_i$$

or $$\sum_{j=1}^{n} x_{ij} + Y_i = X_i$$

also called the "final bill of goods" which it is the function of the output to fill. The balance equation shows the conditions of equilibrium between demand and supply. It shows the flows of outputs and inputs to and from one industry to other industries and vice versa.

Since x_{12} stands for the amount absorbed by industry 2 of the ith industry, it follows that xij stands for the amount absorbed by the ith industry of jth

industry. The "technical coefficient" or "input coefficient" of the ith industry is denoted by:

aij = xij/Xj

where xij is the flow from industry i to industry j, Xj is the total output of industry aij and aij, as already noted above, is a constant, called "technical coefficient" or "flow coefficient" in the ith industry. The technical coefficient shows the number of units of one industry's output that are required to produce one unit to another industry's output. Equation (3) is called a "structural equation." The structural equation tells us that the output of one industry is absorbed by all industries so that the flow structure of the entire economy is revealed. A number of structural equations give a summary description of the economy's existing technological conditions. Using equation (3) to calculate the aij for our example of the two-sector input-output Table 1, we get the following technology matrix.

These input coefficients have been arrived at by dividing each item in the first column of Table 1 by first row total, and each item in the second column by the second row, and so on. Each column of the technological matrix reveals how much agricultural and industrial sectors require from each other to produce a rupee's worth of output. The first column shows that a rupee's worth of agricultural output requires inputs worth 33 paise from industries and worth 17 paise from agriculture itself.

Table 2: Technology Coefficient Matrix A

	Agriculture	*Industry*
Agriculture	50/300= .17	150/500= .30
Industry	100/300= .33	250/500= .50

4.6. PEAK LOAD PRICING

The Peak Load Pricing definition involves a mechanism where customers must pay higher prices for a service during peak demand. The price of the services or goods is not fixed in peak load pricing. Instead, they vary with factors like demand, market conditions, or type of customers. The primary focus of this practice is to control the demand according to the supply capacity. For example, peak load pricing can also be applied to highways or

roads. Firms often charge a higher toll during peak traffic hours to avoid undue congestion. Some travelers may alter their route or schedule to avoid the higher toll, leading to lesser traffic. If this pricing strategy is not followed, it will create a huge jam on the road, leading to trouble for the rules. The authority may have options other than to use peak load pricing or enhance its infrastructure. However, enhancing infrastructure requires a lot of investment. Furthermore, it may remain out of use or waste during the off-season or non-peak time.

Peak Load Pricing helps in useful aid use and avoiding wastage. It helps firms charge more and earn a profit during peak hours while offering discounts during the low-demand time. How does Peak Load Pricing work?

Peak Load Pricing applies to several service industries and goods. Peak Load Pricing Formula or algorithm is applied to select peak and low demand periods. Learn more about the following terms to know the peak load pricing graph.

Marginal Cost: The additional costs incurred by the firm while producing one more unit.

Marginal Revenue: The firm's more revenue during the production or sale of one more unit.

Marginal Cost and Marginal Revenue are equal when the profit is maximized for the firm at that production level. Yet, in the peak load pricing diagram or graph, various levels of production lead to profit maximization.

Let's understand the diagram with peak load pricing electricity example.

D1: Electricity demand during off-peak hours in the night.

P1: The price set during the off-peak hours is normal or discounted, defined by P1.

D2: Electricity requirements are higher during the day, leading to higher production. This boost in production beyond the top level can be expensive for the firm. The demand during peak hours is D2.

P2: The price charged to cover the extra production costs during peak hours is P2.

In this peak load pricing concept, MC is kept equal to MR during the different demand periods. The P2 price is met with the related quantity of output Q2. The P1 level meets with the Q1 amount of output. It leads to a gain in the profit for the firm as likened to when they have to charge a even price all the time.

Advantages of Peak Load Pricing

The peak load pricing strategy can be beneficial for both businesses and customers. Find below the advantages of Peak Load Pricing in Economics.

Profit Maximization

Businesses can earn a higher profit by using peak load pricing. It allows them to charge more during high-demand times and creates a different marginal cost and revenue equilibrium level. The same goes for a low price during the off-season time. If the business has to charge a similar amount for the entire time, it will lose out on the peak time profit. This strategy is essential for businesses where electricity, transport, etc., cannot be stored.

Reduce Peak Time Load

The peak time can put pressure on production levels and supply. It can be costly for businesses to cater to that demand, which might eventually lead to a shortage or non-availability of a commodity. However, the firm can identify its peak times and charge more during that period. This practice will drive away some demand and consumption. It allows the firm to maintain an achievable balance between demand and supply.

Offer Reasonable Prices

Customers would often shift their vacation or electricity use during low demand. They do this to avail lower prices and avoid peak load pricing. Using this differential pricing can help firms offer clients reasonable rates and discounts. They won't have to pay the same if they buy the product or service at a distinct time.

Reducing Expansion Needs

The firm will have to invest in infrastructure to boost its production levels if they don't apply peak load pricing. It will lead to a huge expense, and the grown resources will be useless during the low-demand time. Falling consumption during peak times can help the firm avoid investment in new infrastructure.

Maintain Demand Levels

During the off-peak season, businesses such as resorts or vacation spots may face months of low demand, potentially putting them out of business. However, offering lower prices compared to the peak season can still attract some customers and help such firms yield revenue throughout the year.

These advantages of peak load pricing make it a worthy pricing strategy for businesses to increase their profits and have consistent demand levels.

Also read about perfect competition here.

Disadvantages of Peak Load Pricing

The advantages and disadvantages of peak load pricing should be considered before adopting it for the firm. Find below the major drawbacks of this strategy.

Time-sensitive Deployment

Some products may only be in demand during a festival or holiday. For example, Christmas decorations are purchased only during the holidays, making it essential for the seller to stick to the timeline. If the firm deals in multiple decorative products, they have to launch its products at the perfect time to boost sales and maximize profits during peak season. This practice needs aids and technology, leading to more expenses.

Lack of Information

Many utility firms may not be aware of their demand levels during different seasons. It requires the firm to investigate resources in the research and investigate other factors like the type of clients or market conditions. The surveying and research also need an initial investment on the firm's part if it is new to the market.

4.7. ADMINISTERED PRICING

The administered-pricing doctrine employs either of two major theories to explain how oligopolists set prices. There are known as cost-plus pricing and target-return pricing.

Cost-plus pricing:

Perhaps the most widely accepted method in oligopoly industries like automobiles or newspapers or steel or even aluminium is cost-plus pricing or full-cost pricing. It is a method used by firms to produce goods and services. Firms simply calculate the variable cost of the product, add to it an allocation for fixed costs and then add a profit percentage or mark-up on top of this total cost to arrive at price.

Thus, for instance, if the direct (variable) cost of a product is Rs. 8, its allocated overhead is Rs. 6 and the desired mark-up is 25%, the price of the product will be Rs. 17.50 (= Rs. 8 + Rs. 6 + 0.25 x Rs. 14). Mark-up is usually calculated as a percentage of cost. Profit margin is commonly computed as a percentage of prices. Thus, a 25% mark-up is equivalent to a 20% profit margin.

The cost-plus pricing method is illustrated in Fig.6. The price (OP) is made up of three elements:

(1) A contribution to cover part of the firm's overhead costs (average fixed costs) — AB;

(2) The actual unit cost (average variable cost) of producing a planned output of OQ units — BC;

(3) A profit margin expressed as fixed percentage of total unit costs (average variable cost plus average fixed cost) — CD.

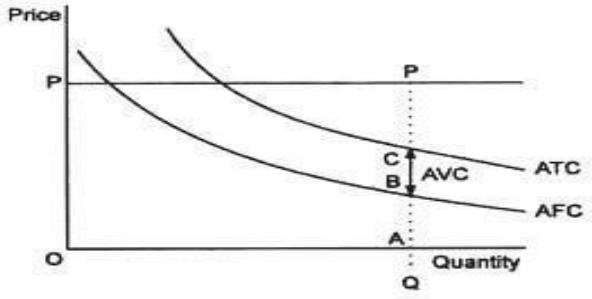


Fig. 6 : The Components of Price

Full-cost pricing is a rule which postulates that firms will add a mark-up onto average variable cost (AVC) so as to cover its average total cost.

Hence, price (P) can be written as:

P = AVC + GPM = ATC

where GPM = gross profit margin (mark-up) and is comprised of an overhead element and a fixed net profit margin thought 'normal' or 'fair' for the industry. Given adoption of this rule supply factors will be predominant consideration in the price-setting process. The term 'full-cost pricing' carries the significance that it is a pricing rule where firms add a net profit margin onto unit costs where the calculation for the latter includes all costs.The modern version of cost-plus pricing theory contends that, at any given level of output, a selling price (P) is determined by adding a percentage mark-up to the direct cost or average variable cost of the product. Thus:P = AVC+ % mark-up (AVC)

Example:

An example will make the concept clear. Suppose, at a firm's planned level of production, its average variable cost is Rs. 40 per unit. If management believes that a 50% mark-up on AVC will maximise its profit, it will charge a price of Rs. 60 per unit: P = Rs. 40 + 0.50 x Rs. 40 = Rs. 60 per unit.

If management finds that this price is too high to maximise profits, it may decide to reduce the mark-up to, say, 20% of AVC.

This results is a price of Rs. 48 per unit:

P = Rs. 40 + 0.20 x Rs. 40 = Rs. 48 per unit

The mark-up percentage is known in the real commercial world as the contribution margin. Usually it is said that the mark-up should guarantee the seller a 'fair profit' or some target profit margin or target rate of return. The margin represents that part of the price, above a firm's AVC, which contributes to the recovery of the fixed costs or overhead and earning of profit.

Target-return Pricing:

In administered-pricing doctrine, the alternative theory to cost-plus pricing is called target-return pricing. It assumes that firms set their prices

so as to achieve a desired (targeted) percentage rate of return on stockholders' equity or ownership at the planned level of output, Q.

Thus, the target return price, P, may be expressed as:

P = % target return (shareholders' equity)/planned output quantity, Q + AVC_Q

For example, suppose a clothing manufacturer plans to produce 10,000 suits next year at an average variable cost of Rs. 80 per suit. If stockholders' equity is Rs. 5 million and the firm targets a 20% return, it will charge a price of Rs 180 per suit:

P = 20 (Rs. 5,000,000)/10,000 + Rs. 80 = Rs. 1,000,000/10,000 + Rs. 80 = Rs. 180 per cent

What are the economic implications of target-return pricing?

As we can see from the equation, three points are especially important:

1. The "mark-up" is added to the firm's average variable cost. In this case, the mark-up, which is Rs 100, is added to the firm's AVC, which is Rs 80. The reason is that the amount of the mark-up determines the firm's contribution margin (= P – AVC).

This, as we saw in the case of cost-plus pricing, contributes to the recovery of fixed costs or overhead and the earning of profit. Of course, management may choose to use a full-cost mark-up based on average total cost, ATC, if sufficient information is available to do so. In reality, the AVC basis is the one that is commonly employed because it represents the firm's direct cost of producing the product.

2. Price varies directly with average variable cost and inversely with the quantity produced. For example, prices will increase if AVC rises or if Q declines. This helps to explain why oligopolists often increase their prices in the face of rising costs and/or declining output.

3. The theory assumes that the firm can sell its planned quantity of output at the target-return price. To the extent that this is true, it is a factor that helps to explain why oligopolistic firms tend to resist price decreases, preferring instead to reduce output, in the face of declining demand.

Check Your Progress:

Q.No	Short Questions	LOCF Mapping		
1.	State the importance of product exhaustion theorem.	K1	CO1	PO1
2.	Recall the functions of Modigliani's model.	K2	CO2	PO1
3.	Summarize the administered pricing with examples.	K2	CO3	PO2
4.	Debate the game theory with give examples.	K5	CO4	PO4
5.	Elucidate the causes of linear programming with the diagram.	K2	CO5	PO2
Q.No	**Essay Type Questions**	**LOCF Mapping**		
1.	Classify the conditions of contestable market and solve the difficulties of market.	K4	CO3	PO3
2.	Elaborately discuss the Modigliani's model with examples.	K2	CO2	PO2
3.	Formulate the Sylos-Labini's model of limit pricing with the help of diagram.	K6	CO4	PO5
4.	Analyze the Bain's limit pricing theory through its guidelines.	K4	CO4	PO4
5.	Create principles, tools and valuation of methods in full cost pricing theory.	K6	CO5	PO5

UNIT – V

DISTRIBUTION THEORIES

5.1. NEO CLASSICAL APPROACH

The modern approach to business investment is based on Dale Jorgenson's approach known as the neo-classical theory of investment. Jorgenson's theory provides the micro- foundation of the aggregate investment function. For analytical convenience, we classify an economy's firms into two broad categories, viz., (i) production firms that produce goods and services using capital owned by other firms by paying lease rental and (ii) rental firms, which buy capital and lease (rent) it to the producing units.

The Rental Price of Capital:

The focus of attention in Jorgenson's theory is on the typical production firm. The firm, operating in a pure competitive model, is guided by the neo-classical marginalist rule of profit maximisation. The key concept in the neo-classical theory is the rental price of capital. A profit-seeking firm compares the cost and benefit of each unit of capital while taking decision on how much of capital to lease in by paying a fixed rental per period. Let us, for instance, take the case of a construction company which has got the contract to construct a multi- storeyed building within a year's time. It requires an earth-moving equipment for three months.

There is no point in buying this machine at a high cost. It gains by hiring this machine from another company (the rental firm) by paying a lease rental. The rental price of capital is the periodic payment that has to be made by the construction company to the leasing firm (which specialises in leasing out the machine) for a certain period to hire the earthmoving equipment. The construction company obtains the equipment by paying a rental of R per period and it sells its output at a price of P. So the real cost of a unit of capital to the production firm is R/P. The real benefit of a unit of capital to a producing firm is its marginal product. The marginal product of capital (MPK) is the addition made to the total product of the firm by one extra unit of real capital. So long as the MPK exceeds the rental price of capital, a firm makes extra profit by hiring and using an extra unit of capital. However, as more and more capital is used, MPK falls and a production firm maximises profit by

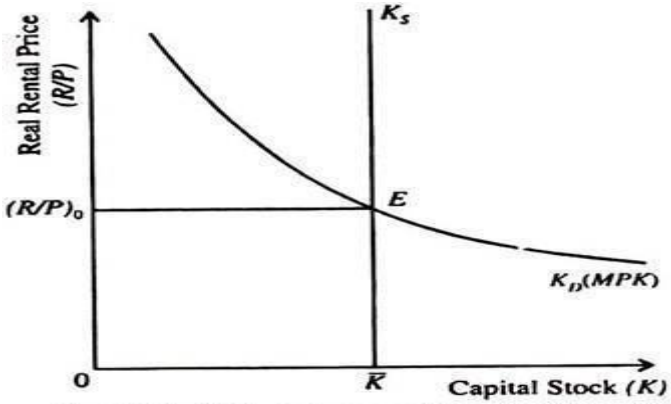


Fig.5.1 Equilibrium in the rental market for capital

equating MPK with the real rental price. In other words, a profit-maximising firm takes capital on lease rental basis until the MPK falls to equal the real rental price. Fig. 5.1 shows the equilibrium in the rental market for capital. The demand curve of capital is the MPK curve. It slopes downward from left to right because as more and more units of capital are used, MPK falls. In other words, MPK is low when the level of capital is high. The aggregate supply of real capital remains fixed in the short run. So the supply curve of capital (indicating the amount of capital available in the economy per period) is a vertical straight line. The real rental price of capital is $(R/P)_0$. This is indeed the equilibrium rental price because it is the rate which brings the demand for capital (as determined by MPK) in line with the fixed supply.

The Cost of Capital and its Determinants:

The benefit of the rental firm from owning capital is the revenue it gets from renting it to the production firms. It receives the real rental price of capital (R/P) for each unit of capital it owns and rents out.

There are three types of costs of owning and renting out a unit of capital:

1. Interest on loan:

When a rental firm borrows funds to buy a unit of capital for the purpose of renting it out, it has to pay interest on the loan. The interest cost is iP_K where i is the nominal interest rate and P_K is the purchase price of a unit of capital.

2. Capital loss:

It is quite possible for the price of capital (the firm is renting out) to fall, in which case the rental firm loses. The reason is that the market value of the firm's capital usually falls. The cost of this loss is $-\Delta P_K$.

3. Depreciation:

The rate of depreciation of capital is another component of the cost of owning and renting out real capital. The rate of depreciation (d) is measured by the proportion of value of the capital lost per period due to wear and tear, i.e., dP_K.

So the total cost of renting out a unit of capital for one period is thus:

Cost of capital = $iP_K - \Delta P_K + dP_K = P_K(i - \Delta P_K/P_K + d)$ ... (1)

So there are four determinants of cost of capital, viz., P_K, i, the rate at which P_K is changing and d. We put a negative sign before $\Delta P_K/P_K$ because P_K is assumed to be falling.

If we make the assumption that the price of capital goods rises with the prices of other goods, as is the case during inflation, then $(\Delta P_k/P_k)$ is interpreted as the overall rate of inflation (π). Since the real rate of interest (r) is the nominal rate of interest (i) less the rate of inflation (π), the cost of capital (C_K) is

$C_K = P_K(i - \pi + d) = P_K(r + d)$ ... (2)

So there are three determinants of the cost of capital, viz., P_K, r and d.

The real cost of capital (C_r) is expressed as

$C_r = (P_K/P)(r + d)$ ... (3)

where P is the overall price index. It is the weighted average of all prices. Equation (3) expresses the cost of capital relative to the prices of other goods in the economy. The real cost of capital is the cost of acquiring and leasing out a unit of capital measured in units of real GDP and has three determinants — P_K/P, the relative price of capital goods, r and d.

The Determinants of Investment:

Since all economic decisions are taken at the margin, a rental firm, whose objective is profit maximisation, has to take decisions regarding whether to increase or decrease its capital stock on the basis of its own benefit-cost calculations. By renting out each unit of capital, the firm earns revenue (R/P) and incurs the real cost $(P_K/P)(r + d)$. So its real profit per unit of capital or the rate of profit is

$p = (R/P) - (P_K/P)(r + d)$ ... (4)

Rate of profit = Real revenue from capital – real cost of capital.

Since the real rental price of capital equals the MPK, in equilibrium, the rate of profit may be expressed as:

$p = MPK - (P_K/P)\ (r + d)$ ... (5)

The rental firm makes a profit (i.e., $p > 0$) if MPK exceeds the real cost of capital. The converse is also true.

Net investment refers to the absolute change in the capital stock of a firm ($I = \Delta K = K_t - K_{t-1}$,). Equation (5) suggests that investment decision of the rental firm, i.e., decision regarding whether to add to its capital stock or allow it to wear out completely depends on whether owning and leasing out capital is a profitable proposition.

So long as MPK exceeds $(P_K/P)\ (r + d)$, the rental firm finds it profitable to make net investment, i.e., add to its existing stock of capital. The converse is also true. If MPK is less than $(P_K/P)\ (r + d)$ the firm will not care about even its existing stock of capital and just allow it to depreciate and shrink.

The Investment Function:

What is true of a firm which owns and rents out capital is equally true of a firm which both uses and owns capital. So we can write

$\Delta K = I_n[MPK - (P_K/P)\ (r + d)]$ ... (6)

Where I_n depends on or is a function of the difference between the MPK and the real cost of capital (C_r). This difference shows how much net investment responds to the incentive to invest. There is an incentive to invest if $MPK > (P_K/P)\ (r + d)$.

The investment function is

$I = I_n[MPK - (P_K/P)\ (r + d)] + dK$ ... (7)

Where I is gross investment which is equal to net investment l_n plus depreciation dK. Thus total spending on business fixed investment depends on MPK, the real cost of capital and the amount of depreciation (i.e., the rate of depreciation times the amount of capital).

Shift of the Investment Schedule:

Any favourable development in the economy which raises the MPK increases the profitability of investment and causes the investment schedule I of Fig. 18.3(b) to shift to the right to I'. This means that more investment takes place at the same real rate of interest.

For example, a favourable technological change which raises the MPK increases the amount of capital goods that lease-renting firms desire to buy at the same real rate of interest.

Inter temporal Adjustment of Capital Stock:

If MPK is initially above the real cost of capital, the capital stock will rise and the MPK will fall. If MPK is initially below the real cost of capital, the capital stock will fall and MPK will rise.

So, ultimately, as the economy's capital stock adjusts, the MPK approaches the real cost of capital and the steady-state level of capital is expressed as:

$MPK = (P_K/P)(r + d)$

Since in such a situation total profit from capital is maximum (constant) and marginal profit is zero, no addition is made to society's stock of capital, i.e.,

$\Delta K = I = 0$

Because $MPK - (P_K/P)(r + d) = 0$. So there is no incentive to make further investment in fixed capital. Thus in the long run when the adjustment of capital stock continues over time MPK equals the real cost of capital. The speed of adjustment toward the steady state depends on the speed with which firms adjust their capital stock. This, in its turn, depends on the cost of building, delivering and installing new capital.

5.2. MARGINAL PRODUCTIVITY THEORY

The oldest and most significant theory of factor pricing is the marginal productivity theory. It is also known as Micro Theory of Factor Pricing. It was propounded by the German economist T.H. Von Thunen. But later on many economists like Karl Mcnger, Walras, Wickstcad, Edgeworth and Clark etc. contributed for the development of this theory. According to this theory, remuneration of cache factor of production tends to be equal to its marginal productivity. Marginal productivity is the addition that the use of one extra unit of the factor makes to the total production. So long as the marginal cost of a factor is less than the marginal productivity, the entrepreneur will go on employing more and more units of the factors. He will stop giving further employment as soon as the marginal productivity of the factor is equal to the marginal cost of the factors.

Definitions:

"The distribution of income of society is controlled by a natural law, if it worked without friction, would give to every agent of production the amount of wealth which that agent creates." -J.B. Clark

"The marginal productivity theory contends that in equilibrium each productive agent will be rewarded in accordance with its marginal productivity." -Mark Blaug

Assumptions of the Theory:

The main assumptions of the theory are as under:

1. Perfect Competition:

The marginal productivity theory rests upon the fundamental assumption of perfect competition. This is because it cannot take into account unequal bargaining power between the buyers and the sellers.

2. Homogeneous Factors:

This theory assumes that units of a factor of production are homogeneous. This implies that different units of factor of production have the same efficiency. Thus, the productivity of all workers offering the particular type of labour is the same.

3. Rational Behaviour:

The theory assumes that every producer desires to reap maximum profits. This is because the organizer is a rational person and he so combines the different factors of production in such a way that marginal productivity from a unit of money is the same in the case of every factor of production.

4. Perfect Substitutability:

The theory is also based upon the assumption of perfect substitution not only between the different units of the same factor but also between the different units of various factors of production.

5. Perfect Mobility:

The theory assumes that both labour and capital are perfectly mobile between industries and localities. In the absence of this assumption the factor rewards could never tend to be equal as between different regions or employments.

6. Interchangeability:

It implies that all units of a factor are equally efficient and interchangeable. This is because different units of a factor of production are homogeneous, since they are of the same efficiency, they can be employed inter-changeable, and e.g., whether we employ the fourth man or the fifth man, his productivity shall be the same.

7. Perfect Adaptability:

The theory takes for granted that various factors of production are perfectly adaptable as between different occupations.

8. Knowledge about Marginal Productivity:

Both producers and owners of factors of production have means of knowing the value of factor's marginal product.

9. Full Employment:

It is assumed that various factors of production are fully employed with the exception of those who seek a wage above the value of their marginal product.

10. Law of Variable Proportions:

The law of variable proportions is applicable in the economy.

11. The Amount of Factors of Production should be Capable of being varied:

It is assumed that the quantity of factors of production can be varied i.e. their units can either be increased or decreased. Then the remuneration of a factor becomes equal to its marginal productivity.

12. The Law of Diminishing Marginal Returns:

It means that as units of a factor of production are increased the marginal productivity goes on diminishing.

13. Long-Run Analysis:

Marginal productivity theory of distribution seeks to explain determination of a factor's remuneration only in the long period.

Explanation of the Theory:

The marginal productivity theory states that under perfect competition, price of each factor of production will be equal to its marginal productivity. The price of the factor is determined by the industry. The firm will employ that number of a given factor at which price is equal to its marginal

productivity. Thus, for industry, it is a theory of factor pricing while for a firm it is a factor demand theory.

Analysis of Marginal Productivity Theory from the Point of View of an Industry: Under the conditions of perfect competition, price of each factor of production is determined by the equality of demand and supply. As the theory assumes that there exists full employment in the economy, therefore, supply of the factor is assumed to be constant. So, factor price is determined by its demand which itself is determined by the marginal productivity. Thus, under such conditions, it becomes essential to throw light on the demand curve or marginal productivity curve of an industry. As the industry consists of a group of many firms, accordingly, its demand curve can be drawn with the demand curves of all the firms in the industry. Moreover, marginal revenue productivity of a factor constitutes its demand

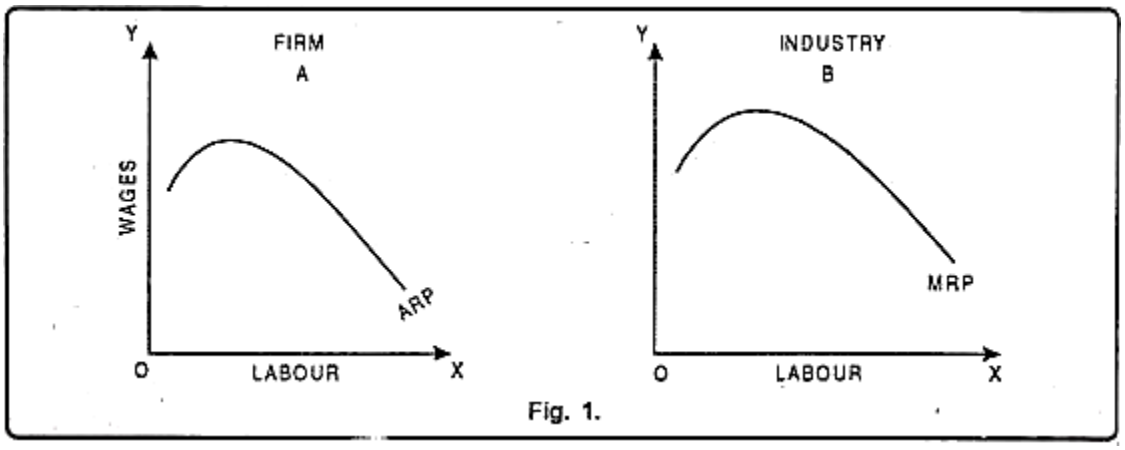


Fig. 1.

curve. It is only due to this reason that a firm's demand or labour depends on its marginal revenue productivity. A firm will employ that number of labourers at which their marginal revenue productivity is equal to the prevailing wage rate. Fig. 2 shows that at wage rate OP_1, the demand for labour is ON_1 and marginal revenue productivity curve is MRP_1. If wage rate falls to OP, firms will increase production by demanding more labour. In such a situation the price of the commodity will fall and marginal revenue productivity curve will also shift to MRP_2.

At OP wages, the demand for labour will increase to ON. DD_1 is the firm's demand curve for labour. The summation of demand of all the firms shows demand curve of an industry. Since the number of firms is not constant under perfectly competitive market, it is not possible to estimate the

summation of demand curves of all firms. However, one thing is certain that is the demand curve of industry also slopes downward from left to right. The point where demand for and supply of a factor are equal will

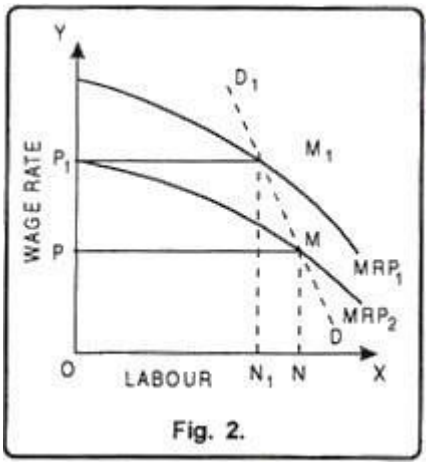


Fig. 2.

determine the factor price for the industry. This theory assumes the supply of a factor to be fixed.

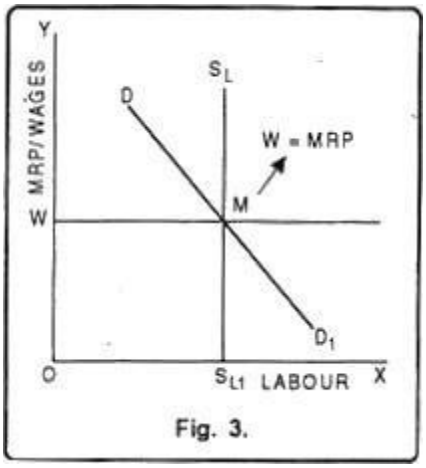


Fig. 3.

Thus factor price is determined by the demand for factor i.e. factor price will be equal to the marginal revenue productivity. It has been shown by Fig. 3. In the Fig. 3, number of labour has been taken on OX axis whereas wages and MRP have been taken on OY axis. DD_1 is the industry's demand curve for labour. This is also the Marginal Revenue Productivity curve.

Factor Price (OW) = Marginal Revenue Productivity MRP. Thus under perfect competition, factor price is determined by the industry and firm demands units of a factor at this price.

Analysis of Marginal Productivity Theory from the Point of View of Firm: Under perfect competition, number of firms is very large. No single firm can influence the market price of a factor of production. Every firm acts as a price taker and not a price maker. Therefore, it has to accept the prevailing price. No employer would like to pay more than what others are paying. In other words, a firm will employ that number of a factor at which its price is equal to the value of marginal productivity. Therefore, from the point of view of a firm, the theory indicates how many units of a factor it should demand.

It is due to this reason that it is also called Theory of Factor Demand. Other things remaining the same, as more and more labourers are employed by a firm, its marginal physical productivity goes or-diminishing. As price under perfect competition remains constant, so when marginal physical productivity of labour goes on diminishing, marginal revenue productivity will also go on diminishing. Therefore, in order to get the equilibrium position, a firm will employ labourers up to a point where

Table 2. Factor Demand by the Firm

Labourer	MPP	Price of Product	MRP (MPP × MR)	Wage Rate
1.	20	5	20 × 5 = 100	55
2.	17	5	17 × 5 = 85	55
3.	14	5	14 × 5 = 70	55
4.	11	5	11 × 5 = 55	55
5.	8	5	8 × 5 = 40	55

their respective marginal revenue productivity is equal to their wage rate. Table 2 indicates that wage rate of labour is Rs. 55 per labourers. Price of the product produced by the labourer is Rs. 5 per unit. Now, when a firm employs one labourer, his marginal physical productivity is 20 units. By multiplying the MPP with price of the product we get marginal revenue productivity. Here, it is Rs. 100 for the first labour. The marginal revenue productivity of second labourer is Rs. 85 and of third labourer it is Rs. 70. The marginal revenue productivity of fourth labourer is Rs. 55 which is equal to wage rate. The firm will earn maximum profits if it employs up to the fourth labourer. If the firm employs fifth labourer, it will have to suffer

losses of Rs. 15. Therefore, to get maximum profits, a firm will employ a factor upto a point where MRP is equal to price.

In Fig. 4 number of labourers has been measured on OX-axis and wage rate on Y-axis. MRP is marginal revenue productivity curve and WW is the wage rate prevailing in the market. Since, under perfect competition wage

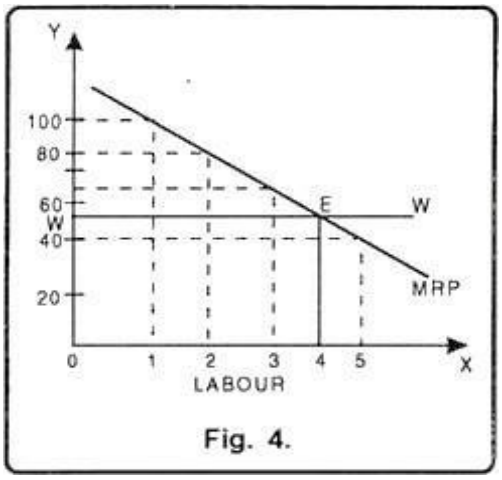


Fig. 4.

rate will remain constant that is why WW wage line is parallel to OX-axis. MRP curve is sloping down-ward. It cuts WW at point E which is the equilibrium wage rate of Rs. 55. At point E, firm will demand only four labourers. Thus, from the above, we can conclude that a factor is demanded up to the limit where its marginal productivity is equal to prevailing price.

Under perfect competition, in long period in the equilibrium position, not only the marginal wages of a firm are equal to marginal revenue productivity, even the average wages of the firm are equal to average net revenue productivity as has been shown in Fig. 5. The fig. 5 shows that at point 'E' marginal wages of labour are equal to marginal revenue productivity and the firm employs OM number of workers. At this point, even the average net revenue productivity is equal to average wages. Thus firm earns only normal profit. If wage line shifts from NN to N[N] then the demand for labour increases from OM to OM_1.

Determination of Factor Pricing under Imperfect Competition:

Marginal productivity theory applies to the condition of perfect competition. But in real life we face imperfect competition. Therefore, economists like Robinson, Chamberlin have analyzed factor pricing under

imperfect competition. There are various firms under imperfect competition. But here we shall analyze only Monopsony. Under

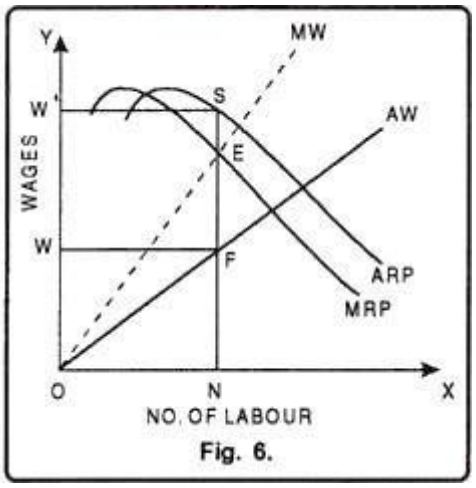


Fig. 6.

monopsony, there is perfect competition in product market. Consequently MRP is equal to VMP. There is imperfect competition in factor market.

It indicates that there is only one buyer of the factors. Therefore, monopsony refers to a situation of market where only a single firm provides employment to the factors. If the firm demands more factors, factor price will go up and vice-versa. However, the determination of factor price under monopsony can be explained with the help of Fig. 6.

In Fig. 6 number of labourers has been shown on X-axis and wages on Y-axis. MW is marginal wage curve and ARP is the average wage curve. MRP is the marginal revenue productivity curve and AW is the average revenue productivity curve. In the fig. 6 a monopsony will employ that number of labourers at which their marginal wage is equal to MRP. In the fig. 6 firm is in equilibrium at point E. Here, firm will employ ON labourers and they will be paid wages equal to NF. In this way, ON labourers will get less wages than their MRP i.e. EN. Monopsony firm will have EF profit per labourer which arises due to exploitation of labourers. Total profit SFWW' is due to exploitation of labour.

5.3. PRODUCT EXHAUSTION THEOREM

The product exhaustion theorem states that since factors of production are rewarded equal to their marginal product, they will exhaust the total product.

The way this proposition is solved has been called the adding-up problem Wick-steed in the Coordination of the Laws of Distribution demonstrated with the help of Euler's Theorem (developed by Leonhard Euler, a Swiss mathematician of the eighteenth century) that payment in accordance with marginal productivity to each factor exactly exhausts the total product.

The adding-up problem states that in a competitive factor market when every factor employed in the production process is paid a price equal to the value of its marginal product, then payments to the factors exhaust the total value of the product.

It can be shown numerically as under:

$Q = (MP_L)\ L + (MP_c)\ C$

where Q is total output, MP is marginal product, L is labour and K is capital. To find out the value of output, multiply through P (price). Thus

$PxQ = (MP_L \times P)\ L + (MP_C \times P)\ C$

$(MP_L \times p)$ — VMP, and $(MP_c \times P) = VMP_C$

$PO = VMP_L \times VMP_C$

Where VMP, is the value of marginal product of labour and VMP_c is the value of marginal product of capital.

Importance of Product Exhaustion Theorem:

Euler's theorem plays an important role in the theory of distribution. The total product is produced by combining different factors of production. The question that arises is how the total output should be distributed among the factors of production?

If the production function is homogeneous of degree one, then Eular's theorem can solve this question. It provides the solution to the producer's long-run problem of allocation of total product to each factor and the distribution of the total outlay among the different inputs.

The theorem also suggests how a firm should employ the various inputs. It tells us that the firm should employ its inputs to that extent at which the reward to the factor equals its marginal revenue product.

However, Prof. Watson questions the existence of constant returns to scale in the economy. According to him, "The rejoinder here is that in the long-run competitive equilibrium price equals minimum average cost, the firm's cost

curve at that point being horizontal. The momentary constancy of unit cost corresponds to a momentary constancy of returns to scale at the point of equilibrium."

5.4. MODERN THEORY OF DISTRIBUTION

The marginal productivity theory, only tells us how many workers an employer will engage at a given wage-level in order to maximise his profit. It does not tell us how that wage-level is determined. The marginal productivity theory approaches the problem of the determination of the reward of a factor of production from the side of demand only. It ignores the supply side. Hence, the marginal productivity theory is not in adequate explanation of the determination of the factor prices.

The modern theory of factor pricing which provides satisfactory explanation of factor prices is the Demand and Supply Theory. Just as the price of a commodity is determined by the demand for, and supply of, a commodity, similarly the price of a productive service also is determined by demand for, and supply of, that particular factor.

Demand for a Factor:

Let us first consider the demand side. In the first place, we should remember that the demand for a factor of production is not a direct demand if is an indirect or derived demand. It is derived from the demand for the produce… that the factor produces. For instance, labour does not satisfy our wants directly. We want labour for the sake of the goods that it produces. It follows, therefore, that if the demand for goods increases, the demand for the factors which help to produce these goods will also increase. Also, if the demand for goods is elastic or inelastic, the demand for the factors too will be elastic or inelastic.

The demand for a factor of production will also depend on the quantity of the other factors required in the process. Generally speaking, the demand price for a given quantity of a factor of production will be higher, the greater the quantities of the co-operating productive services. If more of a factor of production is employed, the marginal productivity of the factor will fall, and

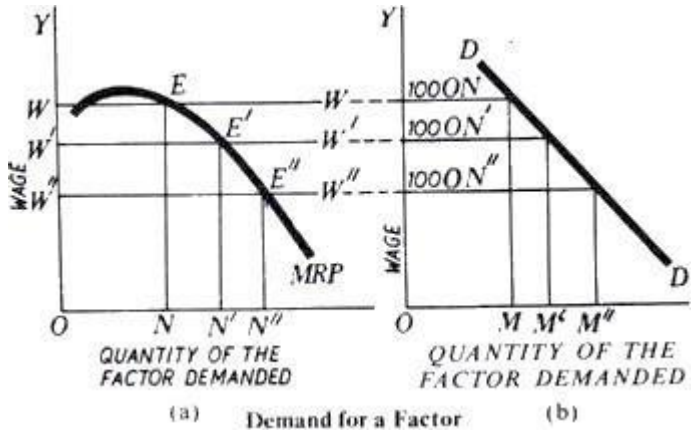


Fig.5.2

the lower will be the demand price for the unit of a productive service. This is another rule connected with the demand for a factor of production.

The demand price of a factor of production also depends on the value of the finished product in the production of which the factor is used. The demand price will generally be greater; the more valuable is the finished product in which the factor is used. Also, the more productive the factor, he higher will be the demand price of a given quantity of the factor.

These are a few points connected with the demand for a productive service. We know that the demand curve of the industry is the sum-total of the demand curves of the various firms in the industry. By a similar summing up, we can have the demand curve of all the industries using a particular productive service.

The demand of the employer for a factor depends on its marginal revenue productivity (in short, marginal productivity), and the quantity of the factor that a firm will employ will depend on the prevailing wage-level. That is more labour will be employed if wages are low and less if wages are high.

Figure 5.2 (a) illustrates the position of a firm regarding the employment of a factor, say, labour. When the wage is OW, the firm is in equilibrium at the point E and the demand for the factor is ON; similarly, at OW' wage, the demand is ON', and at OW" the demand is ON". MRP (marginal revenue productivity) curve is the demand curve for a factor of production by an individual firm.

But for determining the price of a factor, it is not the demand of the individual firm for it that matters. What matters is the total demand, i.e., the sum-total

of the demands of all firms in the industry. The total demand curve is derived by the lateral summation of the marginal revenue productivity curves of all the firms. This curve DD is shown in the Fig. 5.2(b).

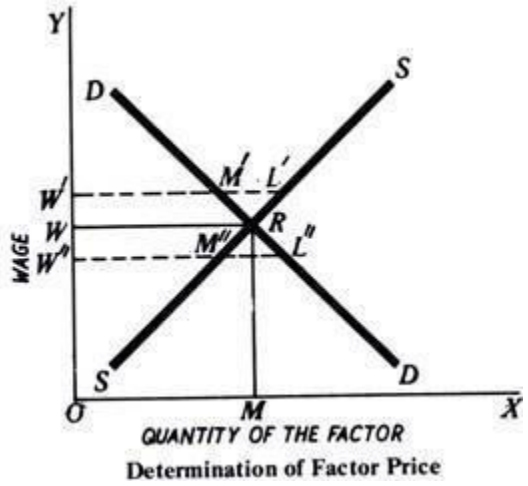
It can be seen that Y-axes in both curves are drawn to the same scale, but X-axes are drawn on different scales. We have supposed that there are 100 firms in the industry. At OW wage, the demand of the individual firm is ON, but the demand of the whole industry at the same wages is OM, which is equal to 100 ON (because the number of firms in the industry is 100). In the same manner, at OW' the demand of the firm is ON' but of the entire industry OM', which is equal to 100 ON', and at OW", the demand of the firm is ON" and that of the industry OM", which is equal to 100 ON".

It can be seen that the demand curve DD slopes downward to the right. The reason is that MRP curve, whose summation is represented by DD, also slopes down similarly to the right in the relevant portion. This means that according to the law of diminishing marginal productivity, the more a factor is employed the lower is the marginal productivity. This is all about the demand side.

Supply Side:

As for the supply side, the supply curve of a factor depends on the various conditions of its supply. Take the case of labour—a very important productive service. The supply of labour will depend on the size and composition of population, its occupational and geographical distribution, labour efficiency, cost of education and training, cost of movement, the expected income, relative preference for work and leisure, and so on. In this manner, by considering all the relevant factors, it is possible to construct the supply curve of a productive service.

At the same time, we must note that the supply is a bit of complicated thing. We generally say that the supply of land is limited. But the fact is that, although for the whole community land is limited, for a particular firm or an industry, its supply is not limited. The supply can be increased if higher rent is offered. In the case of commodities, we see that generally an increase in price brings forth larger supplies. This, however, does not necessarily hold well in the case of the factors of production. It may happen in some cases that, if wags go up,



Determination of Factor Price

Fig.5.3.

labour may be able to satisfy its needs by working for less time than before. They may prefer leisure to work. In this case, when the price of factor (or its remuneration) is increased, the supply is reduced. This peculiarity will be represented by a backward sloping curve after a stage. Also, the supply of labour does not merely depend on economic factors; many non-economic considerations also enter. All the same, we can say that, if the price of a factor increases, its supply will also generally increase, and vice versa. Hence, the supply curve of a factor rises from left to right upwards. This is shown in Fig. 5.3.

Interaction of Demand and Supply:

Now we have worked our way to the demand curve and the supply curve of a factor of production. Both these curves are needed for the determination of the price of a productive service. That price will tend to prevail in the factor market at which the demand and supply are in equilibrium. This equilibrium is at the point of intersection of the demand and supply curves. In Fig. 5.3, they intersect at the point R, and the price of the factor will be OW. At OW' demand W'M' is less than the supply W'L'. In this case, competition among the sellers of the service will tend to bring down the price to OW. On the other hand, at OW" price, the demand W"L" is greater than the supply W"M"; hence price will tend to go up to OW at which the demand and supply will be equal. This is how the price of a factor of production in the factor market is determined by the interaction of the forces of demand and supply relating to

that factor of production. This is the correct and satisfactory theory of distribution.

5.5. FACTOR PRICING IN IMPERFECT PRODUCT AND FACTOR MARKETS

The price of a factor of production is determined when there prevails perfect competition both in the product and factor markets. Before the theories of imperfect competition and monopolistic competition were introduced in economic theory no distinction was made between value of marginal product (VMP) and marginal revenue product (MRP).

That when there is imperfect competition (i.e. monopoly, oligopoly or monopolistic competition) in the product market, marginal revenue differs from the price of the product. As a result, under conditions of imperfect competition in the product market, marginal revenue product (MRP) of the factor differs from value of the marginal product (VMP).

This affects the demand for a factor and the price it will get under conditions of imperfect competition Determination of Factor Price when there exists Monopoly (or Imperfect Competition in the Product Market but Perfect Competition in the Factor Market or monopoly in the product.

Determination of Factor Price when there is Imperfect Competition (or Monopoly) in the Product Market and Perfect Competition in Factor Market:

The determination of prices and employment of factors under imperfect competition in the product and factor markets in general.

We will explain below the employment of a factor by a firm and the price it will pay to a factor when the firm is working under conditions of imperfect competition or monopoly in the product market. However we assume in this section that as far as factor market is concerned perfect competition prevails in it. Since perfect competition is assumed to be prevailing in the factor market, price of the factor will be determined by demand for and supply of the factor of production, as explained above. But now the demand for the factor of production is determined not by the value of the marginal product (VMP) but by the marginal revenue product (MRP) of the factor.

As we will see below, in this case price of the factor, which is determined by demand for and supply of the factor, will be equal to the marginal revenue product, but will be less than the value of the marginal product (VMP) of the factor.

The conditions of firm's equilibrium in factor market developed above will also apply in the present case. The firm working under perfect competition in factor market but monopoly or imperfect competition in the product market would also be in equilibrium position where MRP = MFC, and MRP curve cuts MFC curve from above. But there are some differences between this case and the case explained above. Since in this case, as in the previous, the firm is working under perfect competition in the factor market it will not be able to affect the price of the factor and factor-cost line will be a horizontal straight line. Therefore, the firm will be in equilibrium, that is, will be maximising profits when MRP = MFC = Price of the factor.

But because the firm in the present case is working under conditions of monopoly or imperfect competition in the product market, it will be able to exercise some influence or control over the price of the product. AR curve for it will slope downward and MR curve will be below it. Consequently, MRP which is equal to MPP x MR will not be equal to VMP which is equal to MPP x price of the product. Since MR is less than the price of the product under monopoly or imperfect competition, MRP would be less than VMP.

In symbolic terms:

MRP = MPP x MR

VMP = MPP x Price of the product

Since, under imperfect competition or monopoly in the product market, MR < Price of the product. Therefore

MRP < VMP

In equilibrium in the factor market, the firm will make

P_F =MRP

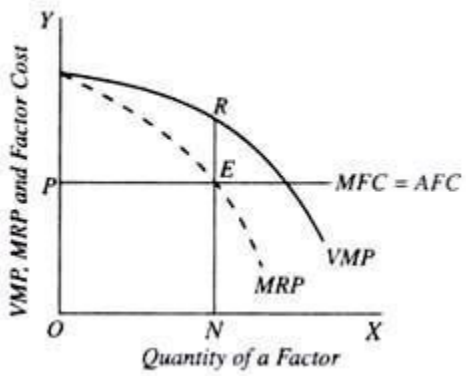
Therefore, P_F = MRP < VMP

It is, therefore, concluded that under conditions of monopoly or imperfect competition in the product market, assuming perfect competition in the factor market, the factor will get price less than the value of its marginal product.

The equilibrium of the firm when it is working under conditions of perfect competition in the factor market and monopoly or imperfect competition in the product market is shown in Figure. Since VMP is greater than MRP when there is imperfect competition in the product market, VMP curve will be above MRP curve (for the sake of convenience, we have drawn only the downward-sloping portions of MRP and VMP curves). The firm will be in equilibrium at E, where MRP = P. The equilibrium employment of the factor is ON. It will be noticed from the figure that the price of the factor OP is, in equilibrium, equal to marginal revenue product EN but is less than its value of marginal product which is equal to RN. Therefore, factor gets RE less than the value of its marginal product.

Meaning of Factor Exploitation:

It follows from above that price of a factor will be less than the value of the marginal product of the factor under conditions of monopoly and imperfect competition in the product market. According to Joan Robinson a factor is



exploited when it is paid less than the value of its marginal product (VMP). Therefore, according to Joan Robinson, when imperfect competition prevails in the product market, labour and other factors, (i.e., factors other than the entrepreneur) are exploited by the entrepreneur. But many economists, especially E.H. Chamberlin, do not agree with Robinson's definition of exploitation of labour. According to Chamberlin, a factor is exploited only when it is paid less than the marginal revenue product (MRP). As explained above, when there prevails imperfect or monopolistic competition (including monopoly and oligopoly) with perfect competition in the factor market, price of a factor is equal to the marginal revenue product, though it is less than the value of the marginal product. Therefore, according to Chamberlin, there is

no any exploitation of labour or any other factor by the entrepreneur when imperfect competition exists in the product market if there is perfect competition in the factor market.

5.6. DETERMINATION OF WAGES

Wage Determination under Perfect Competition in the Labour Market. The analysis of wage determination under conditions of perfect competition is exactly the same as given there. In the case of wage determination, it should be remembered that average factor cost (AFC) becomes average wage (AW) and marginal factor cost becomes marginal wage (MW). When there prevails perfect competition in the labour market, wage rate is determined by the equilibrium between the demand for and supply of labour. Demand for labour is governed by marginal revenue product of labour (MRP).

Wage rate determined by demand for and supply of labour is equal to the marginal revenue product of labour. Thus, under perfect competition in labour market, a firm will employ the amount of labour at which wage rate = MRP of labour.

As regards the supply of labour, it may be pointed out that supply of labour to the whole economy depends upon the size of population, the number of workers available for work out of a given population, the number of hours worked, the intensity of work, the skills of workers and their willingness to work. The size of population depends upon a great variety of social, cultural, religious and economic factors among which wage rate the size of population rises or falls with a rise or fall respectively in the wage rate, and from this they had deduced a law called “Iron Law of Wages”. But the history has shown that rise in the wage rate may have just the opposite effect on the size of population from what the subsistence theory of wages conceives.

Moreover, the historical experiences have revealed that the size of population is dependent upon the great variety of social, cultural, religious and economic factors among which wage rate plays only a minor determining role. However, the willingness to work may be influenced greatly by the changes in the wage rate. On the one hand, as wages rise, some persons will do not work at lower wages may now be willing to supply their labour. But, on the other hand, as wages rise, some persons may be willing to work fewer hours and others like

women may withdraw themselves from labour force, since the wages of their husbands have increased. Thus there are two conflicting responses to the rise in wages and therefore the exact nature of supply curve of labour is difficult to ascertain. It is, however, generally held that the total supply curve of labour rises up to a certain wage level and after that it slopes backward. This is shown in Fig. 5.4. As wage rate rises up to OW, the total quantity supplied of labour rises, but beyond OW, the quantity supplied of labour decreases as the wage rate is increased.

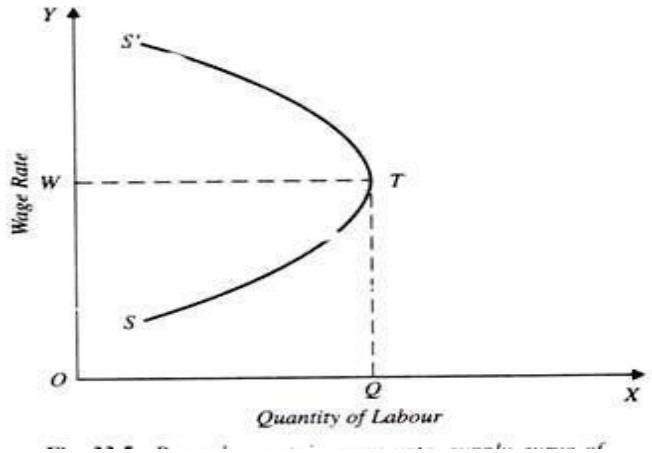


Fig.5.4. Supply curve of labour is backward sloping

But so far as supply of labour to a particular industry is concerned it slopes upward. As the wages in an industry are increased labourers from other industries will shift to this industry. The elasticity of the supply curve of labour to an industry will also depend upon the transfer earnings of labourers. Similar is the case of supply of workers to a particular occupation. If wages in one occupation go up, some persons from other similar occupations would be attracted to it and thus the supply of labour to that occupation will increase. Thus because of occupational shifts, the supply curve of labour to a particular occupation is elastic and rises upwards. The long-run supply curve of labour is more elastic than the short-run supply curve since, in the long-run, besides the occupational shift in the labour force, new entrants in the labour market (who are now children) can also adopt the occupation by getting

training for it in the very first instance. How the wage rate is determined by demand for and supply of labour is shown in Figure 33.6 where DD represents

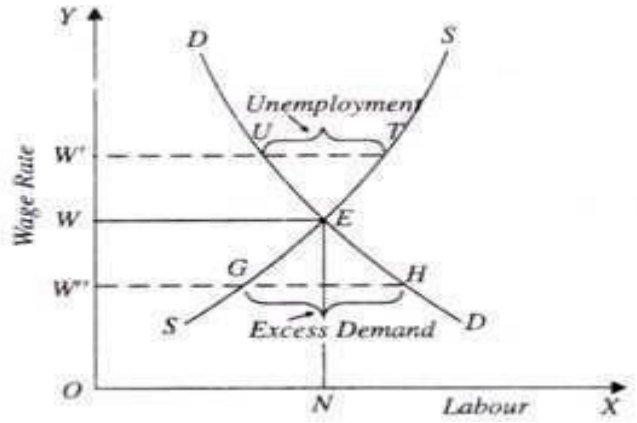


Fig.5.5.Determination of wages

the demand curve for labour and SS represents its supply curve. The two curves intersect at point E. This means that at wage rate OW, quantity demanded of labour is equal to quantity supplied of it. Thus, given the demand for and supply of labour wage rate OW is determined and at this wage rate labour market is cleared. All those who are willing to work at the wage rate OW get employment. This implies that there is no involuntary unemployment and full employment of labour prevails. It is important to note that there will be no equilibrium at any wage rate higher or lower than OW. For example, at a higher wage OW c supply of labour exceeds quantity demanded of it and as a result involuntary unemployment equal to UT emerges. Given the competition among labourers, this unemployment would push down the wage rate to OW. On the other hand, at a lower wage rate OWC the demand for labour exceeds the amount of labour which people are willing to supply. In view of the excess demand for labour, the wage rate will go up to OW where the demand for labour equals the amount supplied of it. Thus wage rate OW will finally settle in the labour market. Though wage rate is determined by demand for and supply of labour, it is equal to the value of marginal product of labour. This is so because in order to maximise its profits, a firm will equalise the wage rate with the value of the marginal product (VMP) of labour. If the firm stops short of this equality, the value of the marginal product (VMP) will be greater than the wage rate which would imply that there was still scope for earning more profits by increasing the employment of

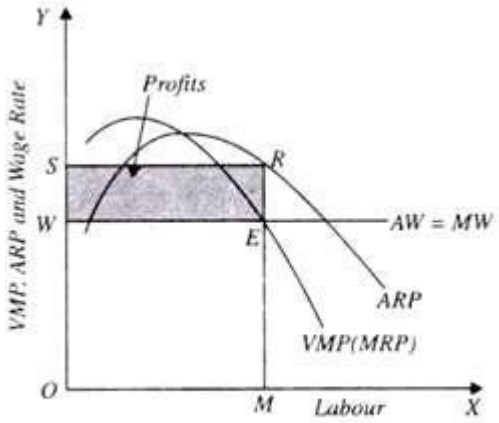


Fig. 33.7. *Equilibrium of the Firm with Super-Normal Profits*

labour. On the other hand, if the firm goes beyond and employs more labour than the equality point, the value of the marginal product of labour will become smaller than the wage rate. As a result, the firm will incur losses on workers employed beyond the equality point and it will therefore be to the advantage of the firm to reduce the employment of labour. Thus in order to maximise profits and be in equilibrium the firm working under conditions of perfect competition in the factor and product markets will employ so much labour that the wage rate is equal to the value of marginal product (or marginal revenue product) of labour.

It will be seen from Fig. 5.5 that the firm working in perfect competition in the labour market will take the wage rate OW as given and equates it with value of marginal product (VMP) and employs OM labour. To sum up, the wage rate is determined by demand for and supply of labour, but is equal to the value of marginal product (or marginal revenue product) of labour.

It is worth mentioning that when the firms are in equilibrium by equating value of marginal product of labour to the wage rate, they may be making profits or losses in the short run. Consider Figure 5.6 which depicts the equilibrium position of the firm in the short run. It will be seen from Fig. 5.6 that at the wage rate OW, the firm is in equilibrium when it is employing OM amount of labour. It will be further seen that the firm is making super-normal profits since in equilibrium employment OM, average revenue product of labour (ARP) which is equal to RM is greater than the wage rate OW (=ME).

This can happen in the short run, but not in the long run. When firms are earning super-normal profits in the short run more entrepreneurs will enter

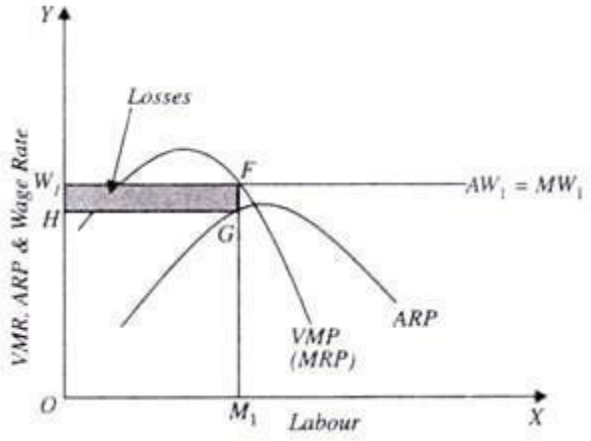


Fig.5.6

the market in the long run to purchase labour to produce the products made by it. Entry of more entrepreneurs to the labour market will compete away the super-normal profits. As a result, the demand for labour will rise and the demand curve for labour will shift outward to the right, which will raise the wage rate and will eliminate the profits. It should be carefully noted that a firm will not employ labour if wage rate exceeds average product of labour. Unlike machines labour is a variable factor and if its employment is not sufficient to recover its wages, it will be laid off even in the short run. Consider Figure at wage rate OW_1, a firm will be incurring losses if it employs ON_1 amount of labour at which wage rate OW_1 = VMP = MRP. Therefore, at wage rate OW_1, the firm will not employ labour.

To sum up, in the long run, the equilibrium between demand for and supply of labour is established at the level where the wage rate of labour is equal to both the VMP (MRP) and ARP of labour and thus the firms earn only normal profits. The long-run equilibrium position of the firm working under perfect competition is depicted in Fig. 5.7 where it will be seen that the firm is in equilibrium at ON level of employment (i.e., at point T) at which wage rate is not only equal to value of marginal product but also average revenue product of labour. Given the ARP and v MP curves, if the wage rate is lower than OW (= N.T.), the number of firms employing labour will change causing changes in demand for labour. As a result of this, the wage rate will ultimately settle at the level OW or NT.

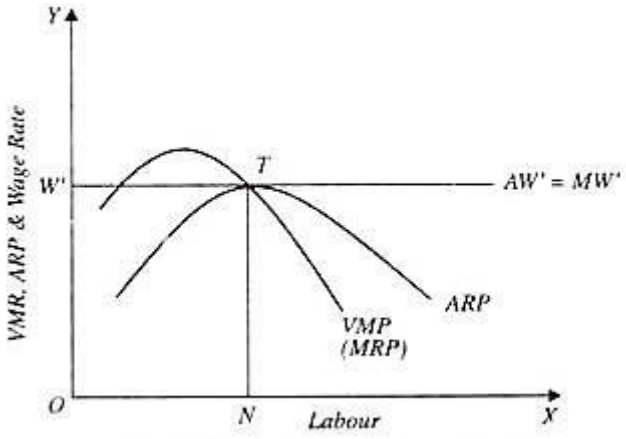


Fig.5.7. Long Run Equilibrium of the Firm

Changes in Equilibrium Wage Rate:

We have explained above how through interaction of demand for and supply of labour determines the market wage rate. Now, if any of the factors causes a shift either in demand curve or in supply curve of labour, the equilibrium will be disturbed causing a change in the wage rate. Both demand for and supply of labour can shift.

Shift in Demand Curve for Labour:

Demand for labour increases if its productivity increases, say through technological improvement. This will cause a rightward shift in the demand curve for labour and as shall be seen from Figure this will bring about a rise in the wage rate. Similarly, if the demand for a product, say of a textile cloth, increases, the demand for textile workers being a derived demand will also go up. This too will cause an upward shift in the demand for textile workers causing a rise in their wage rate. Further, if the price of a textile cloth rises, it will increase the value of marginal product, (VMP = Price x MPP) of textile workers. With this higher value of marginal product, it will become profitable for the producer to hire more workers. As a result, demand for textile workers will increase causing a rise in their wage rate.

Factors that influence the wage rate

The eight main factors that influence the determination of wage rates. The factors are: 1. Ability to Pay 2. Demand and Supply 3. Prevailing Market Rates 4. Cost of Living 5. Bargaining of Trade Unions 6. Productivity 7. Government Regulations 8. Cost of Training.

1. Ability to Pay:

The ability of an industry to pay will influence wage rates to be paid. If the concern is running into losses, then it may not be able to pay higher wage rates. A profitable enterprise may pay more to attract good workers. During the period of prosperity, workers are paid higher wages because management wants to share the profits with labour

2. Demand and Supply:

The labour market conditions or demand and supply forces to operate at the national and local levels and determine the wage rates. When the demand for a particular type of skilled labour is more and supply is less than the wages will be more. On the other hand, if supply is more demand on the other hand, is less then persons will be available at lower wage rates also.

According to Mescon, the supply and demand compensation criterion is very closely related to the prevailing pay comparable wage and on-going wage concepts since, in essence of all these remuneration standards are determined by immediate market forces and factors.

3. Prevailing Market Rates:

No enterprise can ignore prevailing wage rates. The wage rates paid in the industry or other concerns at the same place will form a base for fixing wage rates. If a unit or concern pays low rates then workers leave their jobs whenever they get a job somewhere else. It will not be possible to retain good workers for long periods.

4. Cost of Living:

In many industries wages are linked to enterprise cost of living which ensures a fair wages to workers. The wage rates are directly influenced by cost of living of a place. The workers will accept a wage which may ensure them a minimum standard of living.

Wages will also be adjusted according to price index number. The increase in price index will erode the purchasing power of workers and they will demand higher wages. When the prices are stable then frequent wage increases may not be required.

5. Bargaining of Trade Unions:

The wage rates are also influenced by the bargaining power of trade unions. Stronger the trade union higher will be the wage rates. The strength of a trade union is judged by its membership, financial position and type of leadership.

6. Productivity:

Productivity is the contribution of the workers in order to increase output. It also measures the contribution of other factors of production like machines, materials and management. Wage increase is sometimes associated with increase in productivity.

Workers may also be offered additional bonus, etc., if productivity increases beyond a certain level. It is common practice to issue productivity bonus in industrial units.

7. Government Regulations:

To improve the working conditions of workers, government may pass a legislation for fixing minimum wages of workers. This may ensure them a minimum level of living. In under developed countries bargaining power of labour is weak and employers try to exploit workers by paying them low wages.

In India, Minimum Wages Act, 1948 was passed to empower government to fix minimum wages of workers. Similarly, many other important legislation passed by government help to improve the wage structure.

8. Cost of Training:

In determining the wages of the workers in different occupations, allowances must be made for all the expenses incurred on training and time devoted for it.

5.7. ROLL OF TRADE UNIONS AND COLLECTIVE BARGAINING

A trade union is an association of workers formed with the object of improving the conditions of workers. It is formed for protecting the interests of workers. Workers have little bargaining capacity when they are unorganized. In fact, trade union movement began against the exploitation of workers by certain managements under the capitalist system.

The trade union has been defined by different authors as follows:

(1) Webb: Trade union may be defined as "a continuous association of wage earners for the purposes of maintaining or improving the conditions of their working lives."

(2) Lester: "A trade union is an association of employees designed primarily to maintain or improve the condition of employment of its members."

(3) Indian Trade Union Act 1926: "Any combination whether temporary or permanent formed primarily for the purpose of regulating the relations between the workmen and employers".

Objectives of Trade Union:

The following are the objectives of trade union:

(1) To improve the economic lot of workers by securing they better wages.

(2) To secure for workers better working conditions.

(3) To secure bonus for the workers from the profits of the enterprise/organization.

(4) To ensure stable employment for workers and resist the schemes of management which reduce employment opportunities.

(5) To provide legal assistance to workers in connection with disputes regarding work and payment of wages.

(6) To protect the jobs of labour against retrenchment and layoff etc.

(7) To ensure that workers get as per rules provident fund, pension and other benefits.

(8) To secure for the workers better safety and health welfare schemes.

(9) To secure workers participation in management.

(10) To inculcate discipline, self-respect and dignity among workers.

(11) To ensure opportunities for promotion and training.

(12) To secure organizational efficiency and high productivity.

(13) To generate a committed industrial work force for improving productivity of the system.

Functions of Trade Unions:

(1) Collective bargaining with the management for securing better work environment for the workers/ employees.

(2) Providing security to the workers and keeping check over the hiring and firing of workers.

(3) Helping the management in redressal of grievances of workers at appropriate level.

(4) If any dispute/matter remains unsettled referring the matter for arbitration.

(5) To negotiate with management certain matters like hours of work, fringe benefits, wages and medical facilities and other welfare schemes.

(6) To develop cooperation with employers.

(7) To arouse public opinion in favour of labour/workers.

Benefits of Trade Union:

Workers join trade union because of a number of reasons as given below:

1. A worker feels very weak when he is alone. Union provides him an opportunity to achieve his objectives with the support of his fellow colleagues.

2. Union protects the economic interest of the workers and ensures a reasonable wage rates and wage plans for them.

3. Union helps the workers in getting certain amenities for them in addition to higher wages.

4. Union also provides in certain cases cash assistance at the time of sickness or some other emergencies.

5. Union organize negotiation between workers and management and are instruments for settlement of disputes.

6. Trade union is also beneficial to employer as it organizes the workers under one banner and encourages them follow to peaceful means for getting their demands accepted.

7. Trade union imparts self-confidence to the workers and they feel that they are an important part of the organization.

8. It provides for promotion and training and also helps the workers to go to higher positions.

9. It ensures stable employment for the workers and opposes the motive of management to replace the workers by automatic machines.

10. Workers get an opportunity to take part in the management and oppose any decision which adversely effects them.

5.8. COLLECTIVE BARGAINING

Industrial disputes between the employee and employer can also be settled by discussion and negotiation between these two parties in order to arrive at a decision. This is also commonly known as collective bargaining as both the parties eventually agree to follow a decision that they arrive at after a lot of negotiation and discussion.

According to Beach, "Collective Bargaining is concerned with the relations between unions reporting employees and employers (or their representatives). It involves the process of union organization of employees, negotiations administration and interpretation of collective agreements concerning wages, hours of work and other conditions of employees arguing in concerted economic actions dispute settlement procedures".

According to Flippo, "Collective Bargaining is a process in which the representatives of a labor organization and the representatives of business organization meet and attempt to negotiate a contract or agreement, which specifies the nature of employee-employer union relationship".

"Collective Bargaining is a mode of fixing the terms of employment by means of bargaining between organized body of employees and an employer or association of employees acting usually through authorized agents. The essence of Collective Bargaining is bargaining between interested parties and not from outside parties".

According to an ILO Manual in 1960, the Collective Bargaining is defined as: "Negotiations about working conditions and terms of employment between an employer, a group of employees or one or more employers organization on the other, with a view to reaching an agreement."

It is also asserted that "the terms of agreement serve as a code defining the rights and obligations of each party in their employment relations with one another, if fixes large number of detailed conditions of employees and during its validity none of the matters it deals with, internal circumstances give grounds for a dispute counseling and individual workers".

Collective Bargaining Involves:

(i) Negotiations

(ii) Drafting

(iii) Administration

(iv) Interpretation of documents written by employers, employees and the union representatives

(v) Organizational Trade Unions with open mind.

Forms of Collective Bargaining:

The working of collective bargaining assumes various forms. In the first place, bargaining may be between the single employer and the single union, this is known as single plant bargaining. This form prevails in the United States as well as in India.

Secondly, the bargaining may be between a single firm having several plants and workers employed in all those plants. This form is called multiple plants bargaining where workers bargain with the common employer through different unions.

Thirdly, instead of a separate union bargaining with separate employer, all the unions belonging to the same industry bargain through their federation with the employer's federation of that industry. This is known as multiple employer bargaining which is possible both at the local and regional levels. Instances in India of this industry-wide bargaining are found in the textile industry.

The common malady of union rivalry, small firms and existence of several political parties has given rise to a small unit of collective bargaining. It has produced higher labour cost, lack of appreciation, absence of sympathy and economic inefficiency in the realm of industrial relationships. An industry-wide bargaining can be favourable to the economic and social interests of both the employers and employees.

Essential Pre-Requisites for Collective Bargaining:

Effective collective bargaining requires the following prerequisites:

(i) Existence of a strong representative trade union in the industry that believes in constitutional means for settling the disputes.

(ii) Existence of a fact-finding approach and willingness to use new methods and tools for the solution of industrial problems. The negotiation should be based on facts and figures and both the parties should adopt constructive approach.

(iii) Existence of strong and enlightened management which can integrate the different parties, i.e., employees, owners, consumers and society or Government.

(iv) Agreement on basic objectives of the organisation between the employer and the employees and on mutual rights and liabilities should be there.

(v) In order that collective bargaining functions properly, unfair labour practices must be avoided by both the parties.

(vi) Proper records for the problem should be maintained.

(vii) Collective bargaining should be best conducted at plant level. It means if there are more than one plant of the firm, the local management should be delegated proper authority to negotiate with the local trade union.

(viii) There must be change in the attitude of employers and employees. They should realise that differences can be resolved peacefully on negotiating table without the assistance of third party.

(ix) No party should take rigid attitude. They should enter into negotiation with a view to reaching an agreement.

(x) When agreement is reached after negotiations, it must be in writing incorporating all term of the contract.

It may be emphasised here that the institution of collective bargaining represents a fair and democratic attempt at resolving mutual disputes. Wherever it becomes the normal mode of setting outstanding issues, industrial unrest with all its unpleasant consequences is minimised.

Main Features of Collective Bargaining:

Some of the salient features of collective bargaining are:

1. It is a Group Action:

Collective bargaining is a group action as opposed to individual action. Both the parties of settlement are represented by their groups. Employer is represented by its delegates and, on the other side; employees are represented by their trade union.

2. It is a Continuous Process:

Collective bargaining is a continuous process and does not end with one agreement. It provides a mechanism for continuing and organised

relationship between management and trade union. It is a process that goes on for 365 days of the year.

3. It is a Bipartite Process:

Collective bargaining is a two party process. Both the parties—employers and employees— collectively take some action. There is no intervention of any third party. It is mutual given-and-take rather than take-it-or-leave-it method of arriving at the settlement of a dispute.

4. It is a Process:

Collective bargaining is a process in the sense that it consists of a number of steps. The starting point is the presentation of charter of demands by the workers and the last step is the reaching of an agreement, or a contract which would serve as the basic law governing labour-management relations over a period of time in an enterprise.

5. It is Flexible and Mobile and not fixed or static:

It has fluidity. There is no hard and fast rule for reaching an agreement. There is ample scope for compromise. A spirit of give-and-take works unless final agreement acceptable to both the parties is reached.

6. It is Industrial Democracy at Work:

Collective bargaining is based on the principle of industrial democracy where the labour union represents the workers in negotiations with the employer or employers. Industrial democracy is the government of labour with the consent of the governed—the workers. The principle of arbitrary unilateralism has given way to that of self-government in industry. Actually, collective bargaining is not a mere signing of an agreement granting seniority, vacations and wage increase, by sitting around a table.

7. It is Dynamic

It is relatively a new concept, and is growing, expanding and changing. In the past, it used to be emotional, turbulent and sentimental, but now it is scientific, factual and systematic.

8. It is a Complementary and not a Competitive Process:

Collective bargaining is not a competitive process. The behavioural scientists have made a good distinction between "distributive bargaining" and "integrative bargaining". The former is the process of dividing up the cake

which represents what has been produced by the joint efforts of management and labour. In this process, if one party wins something, the other party, to continue the metaphor of the cake, has a relatively smaller size of the cake. So it is a win-lose' relationship. The integrative bargaining, on the other hand, is the process where both the parties can win—each party contributing something for the benefit of the other party.

Constituents of Collective Bargaining:

There are three distinct steps in the process of collective bargaining:

(1) The creation of the trade agreement,

(2) The interpretation of the agreement, and

(3) The enforcement of the agreement.

Each of these steps has its particular character and aim, and therefore, each requires a special kind of intellectual and moral activity and machinery.

1. The Creation of the Trade Agreement:

In negotiating the contract, a union and management present their demands to each other, compromise their differences, and agree on the conditions under which the workers are to be employed for the duration of the contract. The coverage of collective bargaining is very uneven; in some industries almost all the workers are under agreement, while in others only a small portion of the employees of the firms are covered by the agreement.

The negotiating process is the part of collective bargaining more likely to make headline news and attract public attention; wage increases are announced, ominous predictions about price increase are reduction in employment are made.

2. The Interpretation of the Agreement:

The administrative process is the day-to-day application of the provisions of the contract to the work situation. At the time of writing the contract, it is impossible to foresee all the special problems which will arise in applying its provisions. Sometimes, it is a matter of differing interpretations of specific clause in the contract, sometimes; it is a question of whether the dispute is even covered by the contract. Nevertheless, each case must somehow be settled. The spirit of the contract should not be violated.

3. Enforcement of the Agreement:

Proper and timely enforcement of the contract is very essential for the success of collective bargaining. If a contract is enforced in such way that it reduces or nullifies the benefits expected by the parties, it will defeat basic purpose of collective bargaining. It may give rise to fresh industrial disputes. Hence, in the enforcement of the contract the spirit of the contract should not be violated.

However, new contracts may be written to meet the problems involved in the previous contract. Furthermore, as day-to-day problems are solved, they set precedents for handling similar problems in future. Such precedents are almost as important as the contract in controlling the working conditions. In short, collective bargaining is not an on-and-off relationship that is kept in cold storage except when new contracts are drafted.

Theories of Collective Bargaining:

There are three important concepts on collective bargaining which have been discussed as follows:

1. The Marketing Concept and the Agreement as a Contract:

The marketing concept views collective bargaining as a contract for the sale of labour. It is a market or exchange relationship and is justified on the ground that it gives assurance of voice on the part of the organised workers in the matter of sale. The same objective rules which apply to the construction of all commercial contracts are invoked since the union-management relationship is concerned as a commercial one. According to this theory, employees sell their individual labour only on terms collectively determined on the basis of contract which has been made through the process of collective bargaining.

The uncertainty of trade cycles, the spirit of mass production and competition for jobs make bargain a necessity. The trade union's collective action provided strength to the individual labourer. It enabled him to resist the pressure of circumstances in which he was placed and to face an unbalanced and disadvantageous situation created by the employer. The object of trade union policy through all the maze of conflicting and obscure regulations has been to give to each individual worker something of the indispensability of labour as a whole.

It cannot be said whether the workers attained a bargaining equality with employers. But, collective bargaining had given a new- relationship under which it is difficult for the employer to dispense without facing the relatively bigger collective strength.

2. The Governmental Concept and the Agreement as Law:

The Governmental Concept views collective bargaining as a constitutional system in industry. It is a political relationship. The union shares sovereignty with management over the workers and, as their representative, uses that power in their interests. The application of the agreement is governed by a weighing of the relation of the provisions of the agreement to the needs and ethics of the particular case. The contract is viewed as a constitution, written by the point conference of union and management representative in the form of a compromise or trade agreement. The agreement lays down the machinery for making executing and interpreting the laws for the industry. The right of initiative is circumscribed within a framework of legislation.

Whenever, management fails to conform to the agreement of constitutional requirements, judicial machinery is provided by the grievance procedure and arbitration. This creates a joint Industrial Government where the union share sovereignty with management over the workers and defend their group affairs and joint autonomy from external interference.

3. The Industrial Relations (Managerial) Concept as Jointly Decided Directives:

The industrial relations concept views collective bargaining as a system of industrial governance. It is a functional relationship. Group Government substitutes the State Government. The union representative gets a hand in the managerial role. Discussions take place in good faith and agreements are arrived at. The union joins with company officials in reaching decisions on matters in which both have vital interests. Thus, union representatives and the management meet each other to arrive at a mutual agreement which they cannot do alone.

To some extent, these approaches represent stage of development of the bargaining process itself. Early negotiations were a matter of simple

contracting for the terms of sale of labour. Developments of the latter period led to the emergence of the Government theory. The industrial relations approach can be traced to the Industrial Disputes Act of 1947 in our country, which established a legal basis for union participation in the management.

Importance of Collective Bargaining:

The collective bargaining advances the mutual understanding between the two parties i.e., employees and employers.

The role of collective bargaining may be evaluated from the following point of view:

(1) From Management Point of View:

The main object of the organisation is to get the work done by the employees at work at minimum cost and thus earn a high rate of profits. Maximum utilization of workers is a must for the effective management. For this purpose co-operation is required from the side of the employees and collective bargaining is a device to get and promote co-operation. The labour disputes are mostly attributable to certain direct or indirect causes and based on rumors, and misconceptions. Collective bargaining is the best remedial measure for maintaining the cordial relations.

(2) From Labour and Trade Union Point of View:

Labour has poor bargaining power. Individually a worker has no existence because labour is perishable and therefore, the employers succeed in exploiting the labourers. The working class in united form becomes a power to protect its interests against the exploitation of the employers through the process of collective bargaining.

The collective bargaining imposes certain restrictions upon the employer. Unilateral action is prevented. All employees are treated on equal footings. The conditions of employment and rates of wages as specified in the agreement can be changed only through negotiations with labour. Employer is not free to make and enforce decisions at his will.

Collective bargaining can be made only through the trade unions. Trade unions are the bargaining agents for the workers. The main function of the trade unions is to protect the economic and non- economic interests of

workers through constructive programmes and collective bargaining is one of the devices to attain that objective through negotiations with the employers, Trade unions may negotiate with the employer for better employment opportunities and job security through collective bargaining.

(3) From Government Point of View:

Government is also concerned with the process of collective bargaining. Government passes and implements several labour legislations and desires it to be implemented in their true sense. If any person violates the rules and laws, it enforces them by force.

Collective bargaining prevents the Government from using the force because an amicable agreement can be reached between employer and employees for implementing the legislative provisions. Labour problems shall be minimised through collective bargaining and industrial peace shall be promoted in the country without any force. Collective bargaining is a peaceful settlement of any dispute between worker and employers and therefore it promotes industrial peace and higher productivity resulting an increase in the Gross National Product or the national income of the country.

Main Hindrances for Collective Bargaining:

The main objective of developing collective bargaining technique is to improve the workers-management relations and thus maintain peace in industries. The technique has developed in India only after India got independence and got momentum since then.

The success of collective bargaining lies in the attitude of both management and workers which is actually not consistent with the spirit of collective bargaining in India. There are certain problems which hinder the growth of collective bargaining in India.

The following factors or activities act as hindrances to effective collective bargaining:

(1) Competitive Process:

Collective bargaining is generally becoming a competitive process, i.e., labour and management compete each other at negotiation table. A

situation arises where the attainment of one party's goal appears to be in conflict with the basic objectives of the other party.

(2) Not Well-Equipped:

Both the parties—management and workers—come to the negotiation table without doing their homework. Both the parties start negotiations without being fully equipped with the information, which can easily be collected from company's records. To start with, there is often a kind of ritual, that of charges and counter charges, generally initiated by the trade union representatives. In the absence of requisite information, nothing concrete is achieved.

(3) Time to Protest:

The immediate objective of the workers' representatives is always some kind of monetary or other gains, accrue when the economy is buoyant and the employer has capacity to pay. But in a period of recession, when demand of the product and the profits are falling, it is very difficult for the employer to meet the demands of the workers, he might even resort to retrenchment or even closure collective bargaining is no answer to such a situation.

(4) Where Prices are fixed by the Government:

In industries, where the prices of products are fixed by the Government, it becomes very difficult for the employer to meet the demands of workers which would inevitably lead to a rise in cost of the products produced. Whereas the supply price to the consumers cannot be increased. It will either reduce the profits of the firm or increase the loss. In other words, it will lead to closure of the works, which again is not in the interest of the workers.

(5) Outside Leadership:

Most of the Indian trade unions are led by outsiders who are not the employees of the concerned organisations. Leader's interests are not necessarily to be identical with that of the workers. Even when his bonafides are beyond doubt, between him and the workers he leads, there cannot be the degree of understanding and communication as would enable him to speak on behalf of the workers with full confidence. Briefly,

in the present situation, without strong political backing, a workers' organisation cannot often bargain successfully with a strong employer.

(6) Multiplicity of Trade Unions:

One great weakness of collective bargaining is the multiplicity of trade unions. In a multiple trade union situation, even a well-recognised, union with long standing, stable and generally positive relationship with the management, adopts a militant attitude as its deliberate strategy.

In Indian situation, inter-union rivalries are also present. Even if the unions combine, as at times they do for the purpose of bargaining with the employer they make conflicting demands, which actually confuse employer and the employees.

(7) Appointment of Low-Status Executive:

One of the weaknesses of collective bargaining in India is that the management deputes a low-status executive for bargaining with the employees. Such executive has no authority to commit anything on behalf of the management. It clearly indicates that the management is not at all serious and the union leaders adopt other ways of settling disputes.

(8) Statutory Provisions:

The constraints are also imposed by the regulatory and participative provisions as contained in the Payment of Wages Act, the Minimum Wages Act, and Payment of Bonus Act etc. Such provisions are statutory and are not negotiable.

(9) Fresh Demands at the Time of Fresh Agreement:

At the time when the old agreement is near expiry or well before that, workers representatives come up with fresh demands. Such demands are pressed even when the industry is running into loss or even during the period of depression. If management accepts the demand of higher wages and other benefits, it would prefer to close down the works.

(10) Agreements in Other Industrial Units:

A prosperous industrial unit in the same region may agree with the trade unions to a substantial increase in wages and other benefits whereas a losing industry cannot do that. There is always pressure on the losing

industries to grant wages and benefits similar to those granted in other (relatively prosperous) units in the same region.

Reasons for the Growth of Collective Bargaining:

The growth of collective bargaining in India may be attributed to the following factors:

(1) Statutory Provisions:

Which have laid down certain principles of negotiations, procedure for collective agreements and the character of representation of the negotiating parties?

(2) Voluntary Measures:

Such as tripartite conferences, joint consultative boards, and industrial committees at the industry level have provided an ingenious mechanism for the promotion of collective bargaining practices.

(3) Several Governments Measures:

Like schemes for workers' education, labour participation in management, the evolution of the code of Inter-union Harmony, the code of Efficiency and Welfare, the Code of Discipline, the formation of Joint Management Councils, Workers Committees and Shop Councils, and the formulations of grievances redressal procedure at the plant level— have encouraged the collective bargaining.

(4) Amendments to the Industrial Disputes Act:

The Amendments to the Industrial Disputes Act in 1964 provided for the termination of an award or a settlement only when a proper notice is given by the majority of workers. Agreements or settlements which are arrived at by a process of negotiation on conciliation cannot be terminated by a section of the workers.

(5) Industrial Truce Resolution:

The Industrial Truce Resolution of 1962 has also influenced the growth of collective bargaining. It provides that the management and the workers should strive for constructive cooperation in all possible ways and throws responsibility on them to resolve their differences through mutual discussion, conciliation and voluntary arbitration peacefully.

Advantages of Collective Bargaining:

Perhaps the biggest advantage of this system is that, by reaching a formal agreement, both sides come to know exactly what to expect from each other and are aware of the rights they have. This can decrease the number of conflicts that happen later on. It also can make operations more efficient. Employees who enter collective bargaining know they have some degree of protection from employer retaliation or being let go from the job. If the employer were dealing with just a handful of individuals, he might be able to afford to lose them. When he is dealing with the entire workforce, however, operations are at risk and he no longer can easily turn a deaf ear to what his employees are saying.

Even though employers might need to back down a little, this strategy gives them the benefit of being able to deal with just a small number of people at a time. This is very practical in larger companies where the employer might have dozens, hundreds or even thousands of workers on his payroll. Working with just a few representatives also can make the issues at hand seem more personal.

Agreements reached through these negotiations usually cover a period of at least a few years. People therefore have some consistency in their work environment and policies. This typically benefits the company's finance department because it knows that fewer items related to the budget might change.

On a broad scale, using this method well can result in more ethical way of doing business. It promotes ideas such as fairness and equality, for example. These concepts can spill over into other areas of a person's life, inspiring better general behavior towards others.

Disadvantages of Collective Bargaining:

A major drawback to using this type of negotiation system is that, even though everyone gets a say in what happens, ultimately, the majority rules, with only a few people determining what happens too many. This means that a large number of people, particularly in the general workforce, can be overshadowed and feel like their opinion doesn't really matter. In the

worst case scenario, this can cause severe division and hostility in the group.

Secondly, it always requires at least two parties. Even though the system is supposed to pull both parties together, during the process of trying to reach an agreement, people can adopt us-versus-them mentality. When the negotiations are over, this way of looking at each other can be hard to set aside, and unity in the company can suffer.

Collective bargaining can also be costly, both in terms of time and money. Representatives have to discuss everything twice—once at the small representative meetings, and again when they relay information to the larger group. Paying outside arbitrators or other professionals quickly can run up a fairly big bill, and when someone else is brought in, things often get slower and more complex because even more people are involved.

Some people point out that these techniques have a tendency to restrict the power of employers. Employees often see this as a good thing, but from the company's perspective, it can make even basic processes difficult. It can make it a challenge to deal with individual workers, for example.

The goal of the system is always to reach a collaborative agreement, but sometimes tensions boil over. As a result, one or both parties might feel they have no choice but to muscle the other side into giving up. Workers might do this by going on strike, which hurts operations and cuts into profits. Businesses might do this by staging lockouts, which prevents members' of the workforce from doing their jobs and getting paid, negatively effecting income and overall quality of living.

Lastly, union dues are sometimes an issue. They reduce the amount of take-home pay a person has, because they usually are deducted right from his paycheck. When things are good in a company and people don't feel like they're getting anything from paying the dues, they usually become unhappier about the rates. The idea of collective bargaining emerged as a result of industrial conflict and growth of trade union movement and was first given currency in the United States by Samuel Crompers. In India the first collective bargaining agreement was conducted in 1920 at the instance of Mahatma Gandhi to regulate labour management relation

between a group of employers and their workers in the textile industry in Ahmadabad.

5.9. THEORIES OF INTEREST

5.9.1. Productivity Theory of Interest:

This theory was propounded by Physiocrats and developed by German economists. According to this theory, interest is paid for the productivity of capital. According to Wicksell, "interest is the payment by the borrower of capital by virtue of its productivity". Capital is productive in the sense that labour, assisted by capital produces more than labour without capital, for example, a fisherman with a net can catch more fish than without it. An agricultural labour with tractor can produce more than without a tractor. Thus capital is as productive as other factors of production.

Criticisms:

1. Economists criticize this theory for having ignored the scarcity, efficiency and supply of capital that determine the rate of interest.
2. If interest depends merely on productivity, interest rates should vary in proportion to the productiveness of capital. Actually pure rate of interest tends to be the same in the market.
3. Even if loans are taken for consumption purposes, interest has to be paid on them. But loans for consumption purposes are not productive.
4. Productivity theory explains interest from the side of demand only and ignores the supply side altogether.
5. Mere physical productivity of capital does not explain interest. If people are willing to lend unlimited amounts of loans (money) without interest, business would expand. Interest would not be a cost. But interest is a cost which every entrepreneur must bear with. Hence price in the long-run, must cover all costs including interest.

5.9. 2. Abstinence or Waiting Theory:

Senior, the classical economist is the exponent of the abstinence theory of interest. According to J.S.Mill, interest is the remuneration for mere abstinence. Abstinence theory explains interest from the side of supply whereas the productivity theory explains from the demand side. According to Senior saving involved a sacrifice which he calls it 'abstinence'. Senior

explains that capital is the result of savings, which in turn are the result of abstinence.

People usually may consume their entire income. They save a part of their income only by abstaining from the present consumption. Thus saving was an act of abstaining from consumption. It was necessary to reward people to abstain from consumption since abstinence is regarded as painful. Interest is thus the reward paid for those who saved rather than consumed their incomes.

Criticism:

1. This theory has failed to explain the demand for capital, hence it is one-sided theory.
2. This theory emphasises that all capital is the result of abstinence, but it is not true.
3. This theory is also criticised on the ground that rich people save without least inconvenience and they do not undergo discomfort on account of saving.
4. Marshall substituted the term waiting for 'abstinence'. Saving means waiting. When a person saves, he does not abstain from consumption for-ever. He just postpones present consumption to a future date. Generally people do not like to wait; an incentive is necessary to encourage this postponement of consumption. Interest is thus an incentive.

5.9.3. Agio or Austrian Theory of Interest:

This theory was first advanced by John Rae and later developed by Bohm Bawerk of the Austrian School of Economics. According to this theory interest arises because people prefer present goods to future goods. If people prefer the present goods, there cannot be savings and capital. To induce people to save and accumulate capital an agio or premium or price must be given.

Thus agio is nothing but interest. People generally prefer the present goods to the future goods for three reasons. According to Bohm Bawerk the first reason is an under valuation of the future purchasing power as compared with the present purchasing power, moreover future is uncertain. In the second place present wants are felt more keenly than the future good.

Yet another reason is that a person expects improvement in economic position in future as a result of which the marginal utility of his income will decline. He therefore prefers to use his income at the present when the marginal utility of his income is high. A premium or agio must be given to the lender if he has a part with his income at the present. This premium is the so- called interest.

Criticism:

1. This theory failed to explain the forces of demand and supply for capital that determine the rate of interest.
2. The reasons given by Bohm Bawerk do not apply always.
3. The technical superiority of present goods of Bohm Bawerk has been criticised by Irving fisher.

5.9.4. Fisher's Time Preference Theory:

This theory is associated with Irving Fisher who emphasises time preference as the central point in the theory. This theory is based on the subjective valuation of income and people's time preference. According to this theory "interest is the price of time". In the words of Fisher "interest is an index of community's preference for a dollar of present over a dollar of future income'.

People in general prefer the present to the future. This is what he calls the time preference. By time preference Fisher means individual's preference for the present to the future or people's discounting or under estimating the future.

There is a tendency on the part of the people to vary the income meant for consumption from time to time by saving and borrowing. Interest is the price paid to the people for present income rather than for future income. According to Fisher the rate of interest varies according to the time preference.

The time preference depends upon the size of income, the distribution of income over the period of time, the composition of income, the certainty of enjoying income in the future, the temperament and the character of the individuals and expectation of the life of the people. If the income size is

large, individual will satisfy present wants more and discount the future at a lower rate.

The distribution of income may take place in three different ways. It may be uniform throughout the life or increase with age or decrease with age. If it is uniform individuals will have their time preference according to the size of their income and temperament. But if the income increases with age, individuals will tend to discount the future at a higher rate because their future is well provided. If the income decreases with age, the future will be discounted at a lower rate.

Regarding the degree of enjoying the income in the future, greater the certainty of enjoying income in the future smaller is the degree of time preference. But if the enjoyment of income is not certain the degree of time preference will be greater. The character of individuals also influences time preference.

A person of forethought discounts the future at a low rate compared to a spend thrift. Similarly a person who expects to live long has less time preference than one who expects to live short. These factors determine individual's rate of time preference. When the rate of time preference is higher than the market rate of interest, the individuals will borrow; if it is lower he will lend to the market.

Criticism:

1. Fisher's theory fails to show the influence of the banking system on rate of interest.

2. This theory gives too much importance to willingness or preference; moreover this theory lays much emphasis on consumption expenditure out of income.

3. Fisher did not give importance to the impact of expectations on interest rate. The concept of productivity is free from the element of uncertainty. Both the factors namely expectation and uncertainty are crucial factors to Keynesian concept of marginal efficiency of capital.

4. The theory is based on the assumption of fixed purchasing power of money between the present and the future. In the real world, fluctuations in the value of money are the most common.

The time preference theory is superior to the other theories since it explains the rate of interest by reference to demand for and supply of capital. The demand for capital depends upon the marginal productivity of capital to investors while the supply of capital depends upon the time preference of individuals. The rate of interest will be determined at the point of equilibrium between demand for and supply of capital. The time preference theory is a complete theory and is the basis of the modern loanable funds theory of interest rate.

5.9.5. The Classical Theory of Interest:

The classical theory of interest was propounded by the old classical economists. Later it was developed by Marshall, Pigou, Walras, Taussig and Knight. According to this theory rate of interest is determined by the demand for and supply of capital. The rate of interest settles at the point where the demand for capital is equal to supply of capital.

The demand for capital arises from investment and supply of capital from savings. This means that the rate of interest is determined by the volume of savings and volume of investment. This theory explains the rate of interest in terms of saving and investment; this theory is called the saving investment theory of interest.

Classical theory is also known as real or non-monetary theory of interest. This theory refers to saving as real savings and investment as real investment. Real saving refers to those goods which are employed for investment purposes instead of consumption. Real investment refers to the production of capital goods like machinery, buildings, etc., rather than monetary investment, such as stocks and shares.

Thus money does not play an important role in the determination of rate of interest. According to classical economist the rate of interest is determined by the demand for savings to invest in capital goods and the supply of savings. The two sides of the interest determination, namely, the demand for capital and the supply of capital can be analysed.

Demand for Capital

Demand for capital arises on account of its productivity. Firms desire to make new capital goods which are demanded to produce consumer goods. For any type of capital good it is possible to draw a marginal revenue productivity curve showing the addition made to the total revenue by an additional unit of a capital at various levels of the stock of that capital.

The more the capital assets an entrepreneur has, the less revenue or income he will earn by purchasing one more unit of capital. Under perfect competition, it is profitable for a firm to purchase any capital up to the point at which the price of that capital equals its marginal revenue productivity. The entrepreneur will demand capital goods up to the point at which the expected rate of return on the capital goods equals the rate of interest.

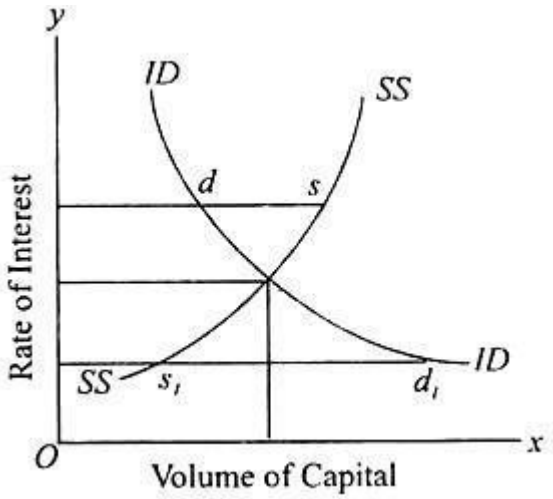
At a higher rate of interest the demand for capital is low and it is high at a lower rate of interest. Thus the demand for capital is inversely related to rate of interest and the demand schedule for capital slopes downward from left to right. However there are certain other factors which govern the demand for capital such as the growth of population, technical progress, the standard of living of the community, etc.

Supply of Capital:

The supply of capital depends upon savings and hence the will to save and the power to save of the community. Some people save irrespective of the rate of interest. They would save even if the rate of interest is zero. Others save because the current rate of interest is just enough to induce them to save. There are potential savers who will save if the rate of interest increases.

In an economy, there may be three types of savers, viz., individual savers, institutional savers like banks, insurance companies, etc., and the government. Saving involves certain inconvenience like sacrifice, or waiting as they have to forgo present consumption which has to be compensated.

The higher the rate of interest, the larger will be the community savings and the more will be the supply of funds. The supply curve of capital thus



slopes upward indicating that more funds will be saved and supplied at a higher rate of interest.

Determination of the Rate of Interest:

The rate of interest is determined by the intersection of the demand for capital (or investment demand) and supply of savings.

This is shown in the figure given below:

The point of equilibrium is E at which investment demand is equal to saving. V is the natural rate of interest. OQ quantity of capital is demanded and supplied, at 'Or' rate of interest. Rate of interest cannot be higher or lower than 'r' since charges in saving and investment will force the rate back to 'r'. For example, if the rate of interest rises above to Or_1 the demand for investment funds will fall and the supply of funds will increase. Since the supply of capital is more than the demand by 'ds' the rate of interest will come down to the equilibrium level 'Or'. If the rate of interest falls to Or_2 the demand for capital will be greater than the supply by S_1d_1 and the rate of interest will rise to 'Or'. At the lower rate of interest, people will save less but the demand for investible funds will increase which will raise the rate of interest to the equilibrium level.

Criticism:

The real theory of the classical economists as propounded by Marshall and Pigou has been criticised by Keynes.

1. Keynes has condemned the classical theory as a useless and unrealistic theory. Keynes does not agree with the classical idea that saving is interest elastic. In fact the level of income has more important influence upon the

amount saved than the rate of interest. For instance, the rich persons in a community will save automatically, even if the rate of interest is zero. Middle income group also save, because they would like to provide security for their families for the future, so they will save even if the rate of interest is zero. If the rate of interest is high, the low income groups may not be in a position to save.

2. Keynes did not agree with the classical relationship between investment and rate of interest. The classical theory assumes that investment demand will be larger at lower interest rate. Keynes shows that investment does not depend upon rate of interest alone but also upon marginal efficiency of capital.

3. Keynes does not agree with the classical theory that the rate of interest equates saving and investment. According to him, any difference between saving and investment will be removed by changes in the levels of income and expenditure rather than by changes in the rate of interest.

4. The classical theory believes that saving and investment are interest elastic, i.e., both are influenced by interest rates. But it is not true; investment, for instance is influenced by marginal efficiency of capital.

5. Another important defect of the theory is that it has not taken into account monetary factors and credit money that determine the rate of interest.

6. Keynes criticizes the basic assumption of the classical theory, namely that the resources in a society are fully employed. He believed, in less than full employment situation, where resources are unemployed interest is not essentially an inducement of saving.

7. The classical theory includes savings out of current income for supply of savings which makes it inadequate. Bank credit and past savings are other sources of supply of capital. The classical theory remains incomplete by neglecting these factors in the supply schedule of capital.

8. Classical theory is criticised as indeterminate. Since savings depend upon the level of income it is not possible to know the rate of interest unless the income level is known before-hand. The income level itself cannot be known without knowing the rate of interest. For each income

level a separate saving curve will have to be drawn. These are circular reasons which offer no solution to the problem of interest.

9. This theory also neglects the influence of the demand for idle money balances on the determination of the rate of interest on the demand side.

10. This theory ignores consumption loans and takes into account only capital used for productive purposes.

5.9. 6. Loanable Funds Theory of Interest:

The loanable funds theory known as the neo-classical theory explains the determination of interest in terms of demand and supply of loanable funds. This theory was developed by Swedish economists and first formulated by Knut Wicksell but contributions were made by other Swedish economists such as Bertil Ohlin, Gunnar Myrdal, Eric Lindahl and English economists like Pigou and Robertson.

The term loanable funds means the total amount of money which is supplied and demanded in the market. According to loanable funds theory interest is the price paid for the use of loanable funds. There are several sources of both supply and demand of loanable funds.

Supply of Loanable Funds:

The supply of loanable funds comes from four basic sources namely, savings dis boarding, bank credit and disinvestment.

(a) Savings:

Private savings, individual and corporate savings are the main source of saving. In the loanable hinds theory savings are classified as planned (exante) and unplanned (expost) savings of individuals and households. Exante savings are planned by individuals at the beginning of a period in the hope of expected incomes and anticipated expenditure on consumption. In the Robertsonian expost sense savings is the difference between the income of the preceding period and the consumption of the present period.

In both the cases the amount saved varies at different rates of interest. More savings will be coming at higher rates of interest. Just like individual, business sector will also save. A part of the earnings of the business is declared a dividend and the undistributed part constitutes business or

corporate savings. Corporate savings also depends upon current rate of interest. A higher rate of interest encourages business savings.

(b) Dishoarding:

Dishoarding also brings forth the supply of loanable funds. When people dishoard the previous hoardings, the supply of loanable funds increases. Cash balances remaining idle in the previous period, becomes active balances in the present period, are available as loanable funds. At higher rate of interest more will be dishoarded.

(c) Bank Credit:

Money created by banks adds to the supply of loanable funds. By creating credit money banks advance loans to the businessmen. The supply of loanable funds varies with rate of interest. Generally the banks will lend more money at higher rates of interest.

(d) Disinvestment:

Sometimes, due to disinvestment funds, flow into capital market adding to the supply of loanable funds. Due to structural changes, the existing stock of machines and other equipment's are not replaced.

They are allowed to wear out. Hence a part of the revenue from the sale of the commodities will not be needed to keep the machines in proper condition or to replace them. Instead this will increase the supply of loanable funds. Disinvestment increases when the rate of interest is high. These components of loanable funds are denoted by savings(s), dishoarding (DH), disinvestment (DI) and bank credit (BM).

Demand for Loanable Fund:

The demand for loanable funds mainly comes from three sectors namely government, businessmen and consumers who need them for purposes of investment, hoarding and consumption. The government borrows funds for the provision of public goods, for development purposes or for war preparations. Major part of demand for loanable funds comes from business firms which borrow money for purchasing or producing new capital goods and for starting investment projects.

This is the most important constituent of demand for loanable funds. Rate of interest is the price of the loanable funds required to purchase the

capital goods. Businessmen will find it profitable to purchase large amount of capital goods, when the rate of interest is low. Thus the demand curve for loanable funds for investment purposes is interest elastic and slopes downwards to the right.

The demand for loanable funds on the part of the consumers is for the purchase of durable consumer goods like scooter, houses, refrigerators, television sets, etc., Lower rates of interest will induce them to borrow more. Hence demand curve for loanable funds for consumption purposes is also downward sloping. Funds are also demanded for the purpose of hoarding them in liquid form as idle cash balances.

This is to satisfy their desire for liquidity preference. It is important to note that a person who supplies the loanable funds is the same person who demands loanable funds for hoarding purposes. A saver for instance who hoards his savings supplies loanable funds and also demands them to satisfy his liquidity preference. Hoarding is also interest elastic. The rate of interest is determined by the equilibrium between the total demand for loanable funds and the total supply of loanable funds.

The loanable funds theory is more realistic than the classical theory in several respects. The classical theory neglects monetary influences on interest. The loanable funds theory takes into account bank credit on the supply side. The theory recognises the role of hoarding as a factor influencing the demand for funds.

Criticism:

1. This theory is unrealistic for combining monetary factors with real factors. It is not proper to combine non-monetary factors like saving and investment with monetary factors like bank credit and dishoarding without bringing changes in the level of income.

2. The theory exaggerates the effect of rate of interest on savings. In fact, the rate of interest does not influence the volume of savings as suggested by the theory. Generally speaking people save not to earn interest. People save more even without any increase in the rate of interest; they save even if the rate of interest falls to zero. Thus for some people savings are interest inelastic.

3. Loanable funds theory like the classical theory is criticised on the ground that it is indeterminate. The supply of loanable funds consists of savings, bank credit and dishoarding.

4. Since savings varies with the level of income, the total supply of loanable funds will also vary with income. Thus loanable funds theory is indeterminate unless the income level is already known.

5. Another criticism against the loanable funds theory is that it is based upon the assumptions of full employment of resources, which does not exist in the real world. Loanable fund theory implies that it is not applicable to the situation of less than full employment. However the theory takes into account the increase in the level of income due to investment and its influence on savings. If full employment is assumed, income would not increase at all.

The theory states that the supply of loanable funds can be increased by releasing cash balances from savings and decreased by absorbing cash balances into savings. This means that the cash balances are elastic. This is not true because the total cash balances available are in fixed proportion to the supply of money at any time. Even if there are variations in the cash balances they are in fact, in the velocity of circulation of money rather than in the amount of cash balances in the community.

5.9.7. Liguidity Preference Theory:

Keynes introduced a monetary theory of interest in his famous book, "The General Theory of Employment, Interest and Money". According to him interest is a reward for parting with liquidity. His theory is known as liquidity preference theory of interest. Liquidity preference means the demand for money to hold or the desire of the public to hold cash. According to Meyer, "liquidity preference is the preference to have an equal amount of cash rather than a claim against others".

To Keynes interest is purely a monetary phenomenon because the rate of interest is determined in terms of money. Money is the most liquid asset and people would like to keep their assets in cash. To make them surrender the liquidity, they must be paid a reward. This reward is paid in the form of liquidity. The more the desire for liquidity, higher shall be the rate of

interest demanded to part with liquidity. This theory is characterised as the monetary theory of interest, as different from the real theory of classical economists.

Factors Determining Liquidity Preference:

Liquidity preference depends upon many factors. According to Keynes the desire for liquidity or the desire of the people to hold liquid cash arises because of three motives, namely:

(i) The transaction motives,

(ii) The precautionary motive and

(iii) Speculation motive.

Transaction Motive:

The transaction motive refers to the demand for money or the 'need for cash for the current transactions of personal and business exchanges'. It is divided into income and business motives. The income motive is meant to bridge the interval between the receipt of income and its disbursement. The business motive refers to the interval between the time of incurring business costs and that of the receipt of the sale proceeds.

If the time between expenditure to be incurred and the receipt of income is small, less cash will be held by the people for current transactions and vice versa. Most of the people receive their income weekly or monthly, while the expenditure is to be incurred every-day. Therefore it becomes necessary to keep certain amount of ready money in hand to make current payments.

Similarly the businessmen and the entrepreneurs also require ready cash to meet their current expenses, especially, for payment for raw materials and transport, to pay wages and salaries and to meet other expenses. Money held for this business motive depends to a large extent on the volume of trade of the firm. Changes in the transaction demand for money depends upon the level of income.

The Precautionary Motive:

Precautionary motive for holding money refers to the desire of the people to hold cash balances for unforeseen contingencies. Both individuals and

businessmen keep cash in reserve to meet expected needs like sickness, accidents, travel, unemployment and other contingencies.

Money held under the precautionary motive is rather like water kept in reserve in a water tank. The precautionary demand for money depends upon the level of income, business activity, and the nature of the individual, availability of cash, the cost of holding liquid assets, financial soundness and accessibility to the credit market.

Speculative Demand for Money:

Money held under speculative motive is for "securing profit from knowing better than the market what the future will bring forth". In other words it reflects the desire to hold one's resources in liquid form in order to take advantage of market movements regarding the future changes in the rate of interest. Individuals and businessmen who have funds after keeping enough for transactions and precautionary purposes like to gain by investing in bonds.

Supply of Money:

Among the two determinants of the rate of interest the supply of money refers to the total quantity of money in circulation for all transactions at any time. It is exogenously determined by monetary authorities. Thus the quantity of money is fixed by the monetary authorities and hence the supply curve of money is assumed to be perfectly inelastic. Supply of money consists of coins, notes and bank deposits.

Determination of the Rate of Interest:

According to Keynes the demand for money namely the liquidity preference and supply of money determine the rate of interest. The rate of interest like the price of a commodity is determined at a level where the demand for money equals the supply of money.

Criticism:

The Keynesian theory of interest has been severely criticised by Hansen, Robertson, Knight and others.

1. This theory explains the working of everything through the bond market and regards bonds as the only alternative to money. Thus the theory lacks realism.

2. This theory points out the rate of interest as purely a monetary phenomenon; real forces like productivity of capital and thriftiness or saving by the people also play an important role in the determination of the rate of interest.

3. Keynes' concept of demand for money is not comprehensive. To him the demand for money means liquidity preference. But money is demanded also for consumption and investment purposes.

4. Keynes states that liquidity is essential for interest rate. But as Hazlitt says, even "if a man is holding his funds in the form of time deposits or short-term treasury bills, he is being paid interest on them.

5. Robertson dubbed this theory as 'at best an inadequate and at worst a misleading account'.

This theory is an incomplete theory because it has not taken into account the factors like credit money and loanable funds for the determination of rate of interest.

6. This theory assumes the supply of money to be constant. Hence the rate of interest is influenced by the demand for money. This theory is thus one-sided.

7. Keynes' theory explains interest as a short-term phenomenon. So it cannot be applied to long period.

8. The greatest fallacy in Keynes' analysis is that it ignores the influence of real factors in determining the rate of interest. Knut Wicksell was the first economist to present a real-cum- monetary theory of interest which was further refined by Irving Fisher.

9. The concept of 'liquidity trap' is also wrong. In reality the liquidity preference schedule may not be perfectly elastic at low rate of interest. Especially during depression, general pessimism prevails in the economy. It is therefore not correct to argue that the rate of interest will go up in future.

10. The Keynesian theory is also indeterminate like the classical theory. The supply and demand for money schedules cannot give the rate of interest if the income level is not known. In the classical theory also the demand and supply schedules for savings offer no solution unless the

income is known. Thus according to Prof. Hansen "Keynes' criticism of the classical theory applies equally to his own theory".

11. Hicks, Lemer, Hansen and others opine that the rate of interest, along with the level of income is determined by factors like investment demand function, the supply of savings function, the liquidity preference function and the quantity of money function. Keynes does not bring all these factors into his theory. Thus Keynes fails to provide an integrated and determinate theory of interest.

5.10. THEORIES OF PROFIT

5.10.1. RENT THEORY OF PROFIT:

This theory was first propounded by the American Economist Walker. It is based on the ideas of Senior and J.S. Mill. According to Mill, "the extra gains which any producer obtains through superior talents for business or superior business arrangements are very much of a kind similar to rent. Walker says that "Profits are of the same genus as rent". His theory of profits states that profit is the rent of superior entrepreneur over marginal of less efficient entrepreneur.

According to these economists, there was a good deal of similarity between rent and profit. Rent was the reward for the use of land while a profit was the reward for the ability of the entrepreneur. Just as land differs from one another in fertility, entrepreneurs differ from one another in ability. Rent of superior land is determined by the difference in productivity of the marginal and super marginal land; similarly the profits of the marginal and super marginal entrepreneurs.

In short it is the intra-marginal lands that earn a surplus over marginal lands. So also intra marginal entrepreneurs earn a surplus over marginal entrepreneur. Just as there is the marginal land, there is the marginal entrepreneur. The marginal land yields no rent; so also marginal entrepreneur is a no profit entrepreneur. The marginal entrepreneur sells his produce at cost price and gets no profit. He secures only the wages of management not profit. Thus profit does not enter into cost of production. Like rent, profit also does not enter into price. Profit is thus a surplus.

Criticism:

1. According to critics there cannot be perfect similarity between rent and profit. Rent is generally positive and in rare cases it may be zero. But rent can never be negative. When entrepreneur suffers losses profit can be negative.
2. The theory explains profit as the differential surplus rather than a reward for an entrepreneur.
3. Profit is not always the reward for business ability. Profit can be due to monopoly or it can arise due to favourable chance to the entrepreneur.
4. This theory maintains that there is no profit entrepreneur just as no rent land. But in practical life there is no such entrepreneur because whether the entrepreneur has ability or not be gets profit as his reward.
5. The system of joint stock enterprise has become more important in the modern economy. The manner in which dividends are distributed among the shareholders is not at all related to latter's ability. Both dull and intelligent shareholders enjoy the same dividends. In fact, the less able may secure more dividends if they possess more shares.
6. This theory assumes that profit does not enter into price. But this is unrealistic because profit as a part of the cost of production does enter into price.
7. Rent is a known and expected surplus. It is also a contractual payment. Profit is unknown.
8. Walker has analysed only surplus profit. But profit can be several other types.'
9. Walker failed to understand the true nature of profit. According to Walker, profit arose on account of the ability of the entrepreneur to undertake risk. Critics point out that profit is not the reward for undertaking risk but it is the reward for the avoidance of risk.

5.10.2. Wage Theory of Profit:

This theory was propounded by Taussig, the American economist. According to this theory, profit is also a type of wage which is given to the entrepreneur for the services rendered by him. In the words of Taussig, "profit is the wage of the entrepreneur which accrues to him on account of his ability".
Just as a labourer receives wages for his services, the entrepreneur works hard gets profit for the part played by him in the production. The only

difference is that while labourer renders physical services, entrepreneur puts in mental work. Thus an entrepreneur is not different from a doctor, lawyer, teacher, etc., who do mental work. Profit is thus a form of wage.

Criticism:

1. The main defect of this theory is that it does not make a distinction between wage and profit. Wages are fixed and certain, but profits are uncertain income.
2. The entrepreneurs undergo risk in production; but the labourer undertakes no such risk.
3. Entrepreneur bears the entire responsibility to organize the business, but labourer need not do so.
4. Profits tend to vary with price but wages do not vary so.
5. The labourer get his wages if he has put in the required amount of labour, but the entrepreneur may not get profit even if he works hard.
6. Profit may include chance gain while wages do not include such an element.

5.10.3. Risk Theory of Profit:

This theory is associated with American economist Hawley. According to him profit is the reward for risk-taking in business. Risk-taking is supposed to be the most important function of an entrepreneur. Every production that is undertaken in anticipation of demand involves risk. According to Drucker there are four kinds of risk. They are replacement, obsolescence, risk proper and uncertainty.

The first two are calculated and therefore they are insured. But the other two are unknown and unforeseen risks. It is for bearing such risk profit is paid to entrepreneur. No entrepreneur will be willing to undertake risks if he gets only the normal return.

Therefore the reward for risk-taking must be higher than the actual value of the risk. If the entrepreneur does not receive the reward, he will not be prepared to undertake the risk. Thus higher the risk greater is the possibility of profit.

According to Hawley the entrepreneur can avoid certain risks for a fixed payment to the insurance company. But he cannot get rid of all risks by means of insurance. If he does so he is not an entrepreneur and would earn only wages of management and not profit.

Criticism:

1. Risk-taking is not the only entrepreneurial function which leads to emergence of profits. Profits are also due to the organizational and coordinating ability of the entrepreneur. It is also reward for innovation.
2. According to Carver profit is paid to an entrepreneur not for beaming the risk but for minimizing and avoiding risk.
3. This theory assumes that profit is proportional to risk undertaken by entrepreneurs. But this is not true in practical life because even entrepreneurs who do not take any risk are paid profit.
4. Knight says that it is not every risk that gives profit. It is unforeseen and non-insured risks that account for profit. According to Knight risks are of two types viz., foreseeable risk and unforeseeable risk. The risk of fire in a factory is a foreseeable risk and can be covered through insurance. The premium paid for the fire insurance can be included in the cost of production. The entrepreneur can foresee such a risk and insures it. An insurable risk in reality is no risk and profit cannot arise due to insurable risk.
5. There is little empirical evidence to prove that entrepreneurs earn more in risky enterprises. In a way all enterprises are risky, for an element of uncertainty is present in them and every entrepreneur aims at making large profits.

5.10.4. The Dynamic Theory of Profit:

Prof. J.B. Clark propounded the dynamic theory of profit in the year 1900. To him profit is the difference between the price and the cost of production of the commodity. Profit is the result of progressive change in an organized society. The progressive change is possible only in a dynamic state. According to Clark the whole economic society is divided into organized and unorganized society. The organized society is further divided into static and dynamic state. Only in dynamic state profit arises.

In a static state, the five generic changes such as the size of the population, technical knowledge, the amount of capital, method of production of the firms and the size of the industry and the wants of the people do not take place; everything is stagnant and there is no change at all. The element of time is

non-existent and there is no uncertainty. The same economic features are repeated year after year.

Therefore there is not risk of any kind to the entrepreneur. The price of the good will be equal to the cost of production. Hence profit does not arise at all. The entrepreneur would get wages for his labour and interest on his capital. If the price of the commodity is higher than the cost of production, competition would reduce the price again to the level of the cost of production so that profit is eliminated.

The presence of perfect competition makes the price equal to the cost of production which eliminates the super normal profit. Thus Knight observes, "Since costs and selling prices are always equal, there can be no profit beyond wages for the routine work of supervision".

It is well known that the society has always been dynamic. Several changes are taking place in a dynamic society.

According to Clark five major changes are constantly taking place in a society. They are:

(1) Changes in the size of the population,

(2) Changes in the supply of capital,

(3) Changes in production techniques,

(4) Changes in the forms of industrial organisation, and

(5) Changes in human wants.

These dynamic changes affect the demand and supply of commodities which leads to emergence of profit. Sometimes individual firms may introduce dynamic changes. For example, a firm may improve its production technique, reduce its cost and thereby increase its profit. The typical dynamic change is an invention. This enables the entrepreneur to produce more and reduce costs, leading to emergence of profit.

Criticism:

1. It is wrong to say that there is no profit in static state because every entrepreneur is paid profit irrespective of the state of an economy.

2. This theory does not fully appreciate the nature of the entrepreneurial function. If there are no profits in a static state, it means there is no

entrepreneur. But without an entrepreneur it is not possible to imagine how different factors of production would be employed.

3. Mere change in an economy would not give rise to profits if those changes are predictable. It is only the unpredictable, provision can be made for such changes and the expenditure can be included in the cost of production.

4. This theory assumes the existence of perfect competition and static state. But they are far from reality.

5. This theory states that profit arises because of dynamic changes. But Knight says that it is only unforeseen changes that give rise to profit.

6. This theory associates profit for imitating progressive changes in the economy. But in reality profit is paid to entrepreneur for other important functions like risk taking and uncertainty bearing.

7. According to Taussig, "dynamic theory has created unnecessary and artificial distinction between "profits" and wage of management

5.10. 5. Schumpeter's Innovation Theory:

This theory was propounded by Schumpeter. This theory is more or less similar to that of Clark's theory. Instead of five changes mentioned by Clark, Schumpeter explains the change caused by innovations in the production process. According to this theory profit is the reward for innovations. He uses the term innovation in a sense wider than that of the changes mentioned by Clark.

Innovation refers to all those changes, in the production process with an objective of reducing the cost of commodity so as to create gap between the existing price of the commodity and its new cost. Innovation may take any shape like introduction of a new technique or a new plant, a change in the internal structure or organizational set up of the firm or change in the quality of raw material, a new form of energy, better method of salesmanship, etc.

Schumpeter makes a distinction between invention and innovation. Innovation is brought about mainly for reducing the cost of production and it is cost reducing agent. Profit is the reward for this strategic role, Innovations are not possible by all entrepreneurs. Only exceptional entrepreneurs can innovate. They are capable of tapping new resources, technical knowledge and reduce the cost of production. Thus the main motive for introducing

innovation is the desire to earn profit. Profit is therefore the cause of innovation.

Profits are of temporary nature. The pioneer who innovates earns abnormal profit for a short period. Soon other entrepreneurs, "swarm in clusters", compete for profit in the same manner. The pioneer will make another innovation. In a dynamic world innovation in one field may induce other innovations in related fields.

The emergence of motor car industry may in turn stimulate new investments in the construction of highways, rubber, tyresm and petroleum products. Profits are thus causes and effects of innovation. The interest of profit leads entrepreneur to innovate and innovation leads to profit. Thus profit has a tendency to appear, disappear and reappear.

Profits are caused by innovation and disappear by imitation. Innovational profit is thus, never permanent, in the opinion of Schumpeter. Therefore it is different from other incomes, such as rent, wages and interest. These are regular and permanent incomes arising under all circumstances. Profit on the other hand is a temporary surplus resulting from innovation.

Prof. Schumpeter also explained his views on the functions of the entrepreneur. The entrepreneur organizes the business and combines the various factors of production. But this is not his real function and this will not yield him profit. The real function of the entrepreneur is to introduce innovations in business. It is innovations which yield him profit.

Criticisms:

1. This theory concentrates only on innovation, which is only one of the many functions of the entrepreneur and not the only factor.
2. This theory does not consider profit as the reward for risk-taking. According to Schumpeter it is the capitalist not the entrepreneur who undertakes risk.
3. This theory has ignored the importance of uncertainty bearing which is one of the factors that determines profit.
4. This theory attributes profit only to innovation ignoring other functions of entrepreneur.
5. Monopoly profits are permanent in nature while Schumpeter says that innovate profits occur temporarily.

6. This theory has presented a very narrow view of the function of the entrepreneur. He not only introduces innovation but he is equally responsible for proper organisation of the business. As such profit is not merely due to innovation. It is also due to organizational work performed by the entrepreneur. As it is well known, every entrepreneur does not innovate and yet he must earn profit if he is to stay in business.

7. It is an incomplete theory because it has failed to explain all the factors that influence profit.

5.10.6. Uncertainty Bearing Theory of Profit:

This theory was propounded by an American economist Prof. Frank H. Knight. This theory, starts on the foundation of Hawley's risk bearing theory. Knight agrees with Hawley that profit is a reward for risk-taking. There are two types of risks viz. foreseeable risk and unforeseeable risk. According to Knight unforeseeable risk is called uncertainty beaming.

Knight, regards profit as the reward for bearing non-insurable risks and uncertainties. He distinguishes between insurable and non-insurable risks. Certain risks are measurable, the probability of their occurrence can be statistically calculated. The risks of fire, theft, flood and death by accident are insurable. These risks are borne by the insurance company.

The premium paid for insurance is included in the cost of production. According to Knight these foreseen risks are not genuine economic risks eligible for any remuneration of profit. In other words insurable risk does not give rise to profit. According to Knight profit is due to non-insurable risk or unforeseeable risk. Some of the non- insurable risks which arise in modern business are as follows:

(a) Competitive risk:

Some new firms enter into the market unexpectedly. The existing firms may have to face serious competition from them. This will inevitably lower down the profit of the firms.

(b) Technical risk:

This risk arises from the possibility of machinery becoming obsolete due to the discovery of new processes. The existing firm may not be in a position to adopt these changes into its organization, and hence suffer losses.

(c) Risk of government intervention:

The government, in course of time, interferes into the affairs of the industry such as price control, tax policy, import and export restrictions, etc., which might reduce the profits of the firm.

(d) Cyclical risk:

This risk emerges from business cycles. Due to business recession or depression, consumer's purchasing power is reduced, consequently demand for the product of the firm also falls.

(e) Risk of demand:

This is generated by a shift or change of demand in the market.

Prof. Knight calls these risks as 'uncertainties' and 'it is uncertainties in this sense which explains profit in the proper use of the term'. These risks cannot be foreseen and measured, they become non- insurable and the uncertainties have to be borne by the entrepreneur. According to this theory there is a direct relationship between profit and uncertainty bearing.

Greater the uncertainty bearing the higher the level of profit. Uncertainty beaming has become so important in business enterprise in modern days, it has come to be considered as a separate factor of production. Like other factors it has a supply price and entrepreneurs undertake uncertainty bearing in the expectation of earning certain level of profit. Profit is thus the reward for assuming uncertainty.

In the modern days production has to take place In advance of consumption. The producers have to face their rival producers and the future is uncertain and unknown. These are uncertainties. Some entrepreneurs are able to see it more clearly than others and therefore able to earn profit.

Criticism:

1. According to this theory, profit is the reward for uncertainty bearing. But critics point out that sometimes an entrepreneur earns no profit in spite of uncertainty bearing.

2. Uncertainty bearing is one of the determinants of profit and it is not the only determinant. Profit is also a reward for many other activities performed by entrepreneur like initiating, coordinating and bargaining, etc.

3. It is not possible to measure uncertainty in quantitative terms as depicted in this theory.

4. In modern business corporations ownership is separate from control. Decision-making is done by the salaried managers who control and organise the corporation. Ownership rests with the shareholders who ultimately bear uncertainties of business. Knight does not separate ownership and control and this theory becomes unrealistic.

5. Uncertainty bearing cannot be looked upon as a separate factor of production like land, labour or capital. It is a psychological concept which forms part of the real cost of production.

6. Monopoly firms earn much larger profits than competitive firms and they are not due to the presence of uncertainty. This theory throws no light on monopoly profit.

Knight's theory of profit is more elaborate than other theories, because it combines the conception of risk, of economic change and of the role of business ability.

5.10.7. Marginal Productivity Theory of Profit:

The general theory of distribution is also applied to the factor, entrepreneur. According to Prof. Chapman, profits are equal to the marginal worth of the entrepreneur and are determined by the marginal productivity of the entrepreneur. When the marginal productivity is high, profits will be high.

Just as marginal revenue productivity of any factor represents the demand curve of a factor the marginal revenue productivity curve of entrepreneur is the demand curve of an entrepreneur. As more and more firms enter into the industry, the marginal revenue productivity (MRP) of entrepreneurship decreases. The slope of the MRP curve will be negative. The supply curve of entrepreneur will be perfectly elastic under perfect competition.

Criticism:

1. This theory is not a satisfactory theory of profit because it is very difficult to calculate the marginal productivity of entrepreneurship.

2. Like land, labour, or capital the marginal revenue productivity of entrepreneurship is a meaningless concept in the case of a firm because unlike other factors, there can be only one entrepreneur in a firm.

3. This theory is based on the homogeneity of entrepreneur, in an industry. Entrepreneurs differ in efficiency. It is therefore, not possible to have one marginal revenue productivity curve for all entrepreneurs. This theory thus fails to determine profit accurately.

4. This theory fails to explain why entrepreneurs sometimes earn windfall or chance gains and even monopoly profits.

5. It is one-sided theory which takes into account only the demand for entrepreneurs and neglects supply of entrepreneurs.

6. It is a static theory according to which all entrepreneurs earn only normal profits in the long- run. In the real world entrepreneurs earn more than normal profit due to its dynamic nature.

In conclusion it can be stated that there are essentially three kinds of profit theories which have been developed during last two centuries. The functional theory of profit regards profit as a reward for a factor of production. Secondly the rent theory of profit regards profit as a residual income or as excess of price over costs. The institutional theory emphasises unearned nature of profit as monopoly profit. None of the theories is satisfactory. Each theory explains profit in terms of one function rather than in terms of all the functions. Economists are of the opinion that it is very difficult to state an adequate theory of profit.

Check Your Progress:

Q.No	Short Questions	LOCF Mapping		
1.	Articulate the concept of loanable fund theory.	K1	CO1	PO2
2.	Compose the limitation of product exhaustion theorem.	K6	CO2	PO5
3.	List out the Schumpeter innovation theory.	K1	CO3	PO1
4.	Define collective bargaining and classify the various features of bargaining.	K2	CO4	PO1
5.	Evaluate the effect of marginal productivity theory of distribution.	K5	CO2	PO4
Q.No	**Essay Type Questions**	**LOCF Mapping**		
1.	Identify the causes of labour exploitation theory.	K1	CO4	PO1
2.	List out the marginal productivity theory of distribution and solve the difficulties of productivity problems.	K3	CO2	PO3
3.	Assess diagrammatically the factor pricing in imperfect product and factor markets.	K5	CO5	PO4
4.	Appraise the demand and supply of factor of production in the theory of distribution.	K5	CO1	PO4
5.	Elaborately discuss the wage determination in a perfectly competitive labour market.	K2	CO5	PO2

Text Books:

1. Jhingan M.L, (2004 Reprint) Advanced Economic Theory (Vrindha Publications (P) Ltd., New Delhi.
2. Agarwal, H.S. Micro Economic Theory, (Ane's Books Pvt. Ltd.,) New Delhi.
3. Kanmony, Cyril. J, (2016) Advanced Micro Economics (Himalaya Publishing House, Mumbai.)

References:

1. Hal R. Varian (2004), Intermediate Micro Economics (East-West Press: New Delhi).
2. Ruffin Roy. J (1992), Intermediate Micro Economics Harper & Collins Publishers.
3. Koutsyiannis A. (1978), Modern Micro Economics, (Macmillan- London).

Web Resources:

1. http://open.oregonstate.education/intermediatemicroeconomics/chapter/module-1
2. http://saylordotorg.github.io/text_introduction-to-economic analysis/s16-monopoly.html
3. http://saylordotorg.github.io/text_introduction-to-economic analysis/s17-games-and -strategic-behaviour.html

Course Outcomes (Cos):

Upon Completion of this course, the Students will be able

No.	Course Outcomes	K-Levels
CO1	To illustrate and analyse the theories of consumer behavior	K1, K2, K4
CO2	To illustrate and identify the choice under uncertainty.	K2, K3
CO3	To compare how price and output is determined in different market situations and evaluate the market structures	K2, K4, K5
CO4	To identify and examine the alternative theories of firms.	K3, K4
CO5	To define, explain, and compare the theory of distribution.	K1, K2, K4

K_1 – Knowledge, K_2 - Understand, K_3 – Apply, K_4 – Analyse, K_5 – Evaluate, K_6 – Create.

CO-PO Mapping (Course Articulation Matrix)

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

Level of Correlation between PSO's and CO's

(Suggested by UGC as per Six Sigma Tool – Cause and Effect Matrix)

Assign the value: **1 – Low; 2 – Medium; 3 – High; 0 – No Correlation**