



**PRINCIPLES OF  
MICROECONOMICS-II**

**School of Social Sciences  
Indira Gandhi National Open University**

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December, 2019

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ISBN : 978-93-89200-04-1

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*Further information on Indira Gandhi National Open University courses may be obtained from the University's office at Maidan Garhi, New Delhi-110 068 or visit University's Website <http://www.ignou.ac.in>.*

Printed and published on behalf of the Indira Gandhi National Open University, New Delhi by Registrar, MPDD, IGNOU.

Lasertypesetted at Graphic Printers, 204, Pankaj Tower, Mayur Vihar, Phase-I, Delhi-110091.

Printed at : A-One Offset Printers, 5/34, Kirti Nagar Industrial Area, New Delhi - 110015

## Course Contents

<b>BLOCK 1</b>	<b>MARKET STRUCTURE</b>	<b>Pages</b>
UNIT 1	Perfect Competition: Firm and Industry Equilibrium	5
UNIT 2	Monopoly: Price and Output Decisions	23
UNIT 3	Monopolistic Competition: Price and Output Decisions	45
UNIT 4	Oligopoly: Price and Output Decisions	63
<b>BLOCK 2</b>	<b>FACTOR MARKET</b>	
UNIT 5	Factor Market and Pricing Decisions	89
UNIT 6	Labour Market	104
UNIT 7	Land Market	117
<b>BLOCK 3</b>	<b>WELFARE, MARKET FAILURE AND THE ROLE OF GOVERNMENT</b>	
UNIT 8	Welfare: Allocative Efficiency under Perfect Competition	131
UNIT 9	Efficiency of the Market Mechanism: Market Failure and Role of the State	145
<b>BLOCK 4</b>	<b>INTERNATIONAL TRADE</b>	
UNIT 10	Theories of International Trade	157
UNIT 11	WTO and India's Trade Policy	168
GLOSSARY		181
SOME USEFUL BOOKS		180

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# INTRODUCTION TO PRINCIPLES OF MICROECONOMICS-II

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Economics is a live subject and helps the economic agents in their decision making like: Which commodities to produce? How to produce? Which techniques to use? Which factors or resources to use, in which combinations to produce and What quantity of a commodity? How consumers make purchasing decisions and how their choices are affected by changing prices and incomes? How firms decide how many workers to hire and how do workers decide where to work and how much work to do? In other words, economics has moved away from financing the activities of state to helping the common man in the street to make many a crucial decisions impinging on their day-to-day life.

We, today incorporate a wide spectrum of activities in the domain of economics. These activities include: (a) consumer's behaviour or choice process; (b) producers' behaviour or how is the production organised and carried on, what is the special role of cost functions? (c) What are the different forms of market organisations; (d) how different individuals co-operate in the process of production to contribute factors owned by them. (e) What are the various types of efficiencies? (f) Under what situations markets fail and how the state can play its role in such situations? Issues pertaining to (a) and (b) have been covered in the course on Principles of Microeconomics - I. The present course on principles of Micro Economics - II aims to expose the learners to the issues pertaining to (c) to (f). The course is divided into four blocks.

**Block 1** throws light on the various forms of market i.e. perfect competition, monopoly, monopolistic competition, and oligopoly. This block comprises 4 units. **Unit 1 on Perfect Competition: Firm and Industry Equilibrium** provides the characteristics of perfectly competitive market and exposes the learners to equilibrium of Firm and Industry under perfect competition. **Unit 2 on Monopoly: Price and Output Decision** deals with pricing and output decisions and price discrimination under monopoly condition. The concept of deadweight loss under monopoly has also be discussed in this unit. The equilibrium conditions of monopolistic competition in short-run and long-run period, theory of excess capacity, the comparison of the various market forms have been provided in **Unit 3**. Price and Output determination under oligopoly have been covered in **Unit 4**.

**Block 2** discusses the Pricing of the factors of production. It comprises three units. Introducing the Marginal Productivity theory of distribution, **Unit 5** provides an overview of how rent and wages are determined. It also provides a bird's eye view on the theories of interest and profit. **Unit 6** acquaints the learners of the role of demand and supply mechanisms in determinations of wages under perfectly competitive labour markets and imperfectly competitive labour markets. It also provides the role of labour unions and explanation of wage differentials. **Unit 7** throws light on features of land as a peculiar factor of production and the various theories of rent.

**Block 3** covers the Welfare Market failure and the role of state. This block comprises two units. **Unit 8** exposes the learners to the various forms of efficiencies under perfectly competitive market economy and the outcome of departures from the assumptions of perfectly competitive market conditions. **Unit 9** highlights the various situations where markets fail and hence the role of state comes into picture.

**Block 4** deals with the issues related to international trade. This block comprises two units. **Unit 10** gives an overview of the various theories of International trade. **Unit 11** touches upon the various issues related to trade policy and World Trade Organisation.

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**BLOCK 3 WELFARE, MARKET FAILURE AND THE ROLE  
OF GOVERNMENT**

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## **BLOCK 3 WELFARE, MARKET FAILURE AND POLE OF THE GOVERNMENT**

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Having discussed on how firms behave in Block 1 and how the prices of factors of production are determined under different market structures in Block 2, in this block we would like to illustrate how perfect competition is conducive to different forms of efficient outcomes. Further, it has also been highlighted how the departure from the assumption of perfectly competitive market results in market failure and hence the need of state intervention. The block comprises of two units.

**Unit 8** exposes the learners to the various forms of efficiencies under perfectly competitive market economy and the outcome of departures from the assumptions of perfectly competitive market conditions. **Unit 9** highlights the various situations where markets fail and hence the role of state comes into picture.



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# UNIT 8 WELFARE: ALLOCATIVE EFFICIENCY UNDER PERFECT COMPETITION

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## Structure

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Efficiency – Definition and Concepts
  - 8.2.1 Productive Efficiency
  - 8.2.2 Technical Efficiency
  - 8.2.3 Efficient Allocation of Resources among Firms
  - 8.2.4 Efficiency in Output Mix
- 8.3 Efficiency in a Perfectly Competitive Market Firm
- 8.4 Efficiency in a Perfectly Competitive Market Economy
- 8.5 Competitive Prices and Efficiency: The First Fundamental Theorem of Welfare Economics
- 8.6 Departing from the Competitive Assumptions
  - 8.6.1 Imperfect Competition
  - 8.6.2 Externalities
  - 8.6.3 Public Goods
  - 8.6.4 Imperfect Information
- 8.7 Let Us Sum Up
- 8.8 References
- 8.9 Answers or Hints to Check Your Progress Exercises

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## 8.0 OBJECTIVES

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After studying this unit, you will be able to:

- clearly state the concept of economic efficiency (Pareto efficiency);
- identify various types of efficiencies and their interrelationship to achieve the Pareto Efficiency;
- distinguish between Pareto efficient and inefficient situations;
- describe the Production possibilities frontier and the marginal rate of transformation;
- appreciate that a perfectly competitive market will exhibit the ‘Productive’ and ‘Allocative’ Efficiencies;

- describe the conditions for economic efficiency in a simplified perfectly competitive market economy;
- explain the essence of the relationship between perfect competition and the efficient allocation of resources also known as First Fundamental Theorem of Welfare Economics;
- describe the conditions under which perfectly competitive markets will fail to achieve the efficient allocation of resources;
- explain that efficient outcome of a perfectly competitive market may not necessarily be socially desirable; and
- briefly explain the policy implications of efficient outcomes reached under the perfectly competitive markets.

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## **8.1 INTRODUCTION**

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The fundamental problem of a society, that led the ‘Economics’ discipline to emerge and take the driver’s seat, is scarcity of resources. The scarcity, which is the originator of ‘efficiency’, calls for the optimal production, consumption and distribution of these scarce resources. In a general sense, an economy is efficient when it provides its consumers with the most desired set of goods and services, given the resources and technology of the economy. One of the most important results in economics is that the allocation of resources by a perfectly competitive market is efficient. This important result assumes that such a perfectly competitive market does not have externalities like pollution or imperfect information. In Unit 1, we have studied the basic characteristics of such a market and how the firms determine their equilibrium level of output given the price of the product. It is a widely accepted view that perfect competition is an idealised market structure that achieves an efficient allocation of resources.

This unit will focus and elaborate in detail this aspect of perfectly competitive market structures which ensure economic and allocative efficiency and maximising profit in the perfectly competitive industries. Our analysis of a close correspondence between the efficient allocation of resources and the competitive pricing of these resources will however be based on the definition of economic efficiency in input and output choices, as given by Vilfred Pareto during the 19<sup>th</sup> century. The unit will also bring out the situations where operation of a perfectly competitive market structure breaks down and thereby loses its property of achieving the efficient allocation of resources.

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## **8.2 EFFICIENCY – DEFINITION AND CONCEPTS**

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We begin with Pareto’s definition of economic efficiency:

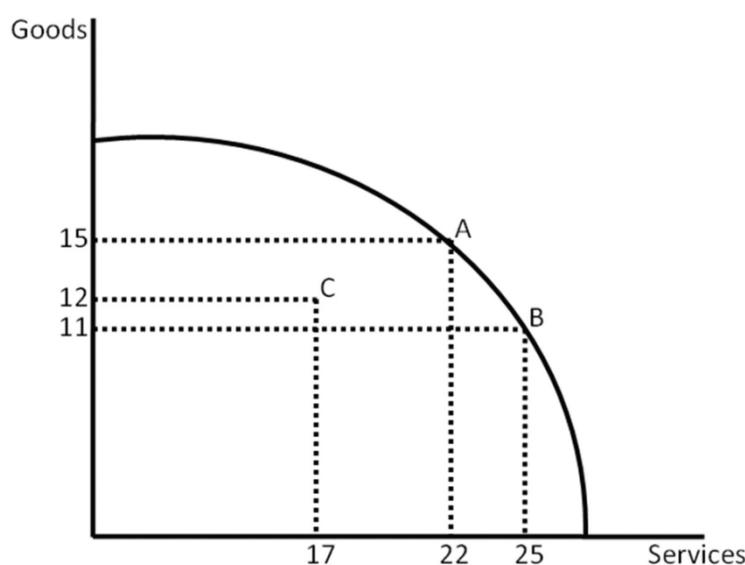
*Pareto efficient allocation: An allocation of resources is Pareto efficient if it is not possible (through further re-allocations) to make one person better-off without making someone else worse-off.*

It is, however, important to note that the achievement of Pareto efficiency in resource allocation requires efficiency in production which is possible only with technically efficient allocation of resources and technical efficiency could be achieved with efficient allocation of resources amongst the firms. Further to ensure overall Pareto optimality, efficiency in production needs to be tied up

with the individual preferences. These concepts are systematically developed in subsequent sub-sections.

### 8.2.1 Productive Efficiency

An economy is efficient in production if it is on its production *possibility* frontier (Fig. 8.1). In terms of Pareto’s terminology, *an allocation of resources is efficient in production (or “technically efficient”) if no further reallocation would permit more of one good to be produced without necessarily reducing the output of some other good.* It seems easier to grasp this definition by studying its converse — an allocation would be inefficient if it were possible to move existing resources around a bit and get additional amounts of one good and no less of anything else.



**Fig. 8.1 : Production possibility frontier of an economy**

Suppose resources were allocated so that production was inefficient; that is, production was occurring at a point inside the production possibility frontier (point C in Fig. 8.1). It would then be possible to produce more of at least one good and no less of anything else. This increased output could be given to some person, making him or her better-off (and no one else worse-off). Points A and B being on the production possibility curve are productively efficient. It is impossible to produce more goods without producing less service. Point C is inefficient because you could produce more goods or services with no opportunity cost. *Hence, inefficiency in production is also Pareto inefficiency.* The trade-offs among outputs necessitated by movements along the production possibility frontier reflect the technically efficient nature of all of the allocations on the frontier.

Productive efficiency will also occur at the lowest point on the firms average costs curve. Thus, Productive efficiency is concerned with producing goods and services with the optimal combination of inputs to produce maximum output for the minimum cost. This point is elaborated in Section 8.3 of this unit.

### 8.2.2 Technical Efficiency

Technical efficiency is the effectiveness with which a given set of inputs is used to produce an output. A firm is said to be technically efficient if a firm is producing the maximum output from the minimum quantity of inputs, such as

labour, capital and technology. **Technical efficiency** is thus a precondition for overall Pareto efficiency<sup>1</sup>.

### 8.2.3 Efficient Allocation of Resources among Firms

In order to achieve technical efficiency, resources must be allocated correctly among firms. Intuitively, resources should be allocated to those firms where they can be most efficiently used. More precisely, the condition for efficient allocation is that the marginal physical product of any resource in the production of a particular good is the same no matter which firm produces that good.

Although equality of marginal productivities will ensure the efficient allocation of resources among firms producing any one good, that condition is not enough to ensure that inputs are allocated efficiently among firms producing different goods. The additional condition for such efficiency is that the rates of technical substitution (RTS) among inputs must be the same in the production of each good if production is to be on the production possibility frontier. For better understanding of this condition, we have shown it graphically in Fig. 8.2.

Figure shows technically efficient ways to allocate the fixed amounts of  $k$  and  $l$  between the productions of the two outputs. The line joining  $O_x$  and  $O_y$  is the locus of these efficient points. Along this line, the RTS (of  $l$  for  $k$ ) in the production of good  $x$  is equal to the RTS in the production of  $y$ .

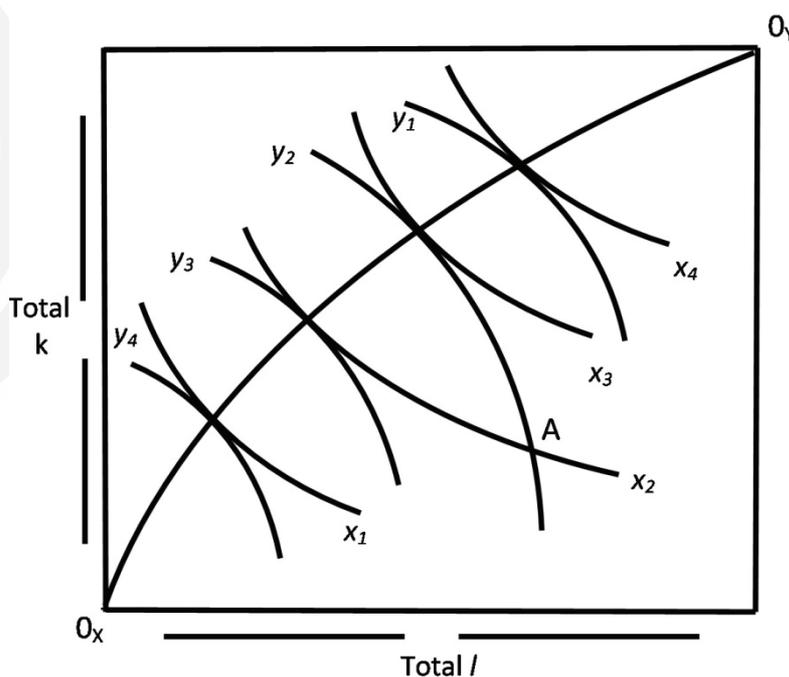


Fig. 8.2: Efficiency in Production

In Fig. 8.2, the length of the box represents total labour-hours and the height of the box represents total capital-hours. The lower left-hand corner of the box represents the “origin” for measuring capital and labour devoted to production of good  $x$ . The upper right-hand corner of the box represents the origin for resources devoted to  $y$ . Using these conventions, any point in the box can be

<sup>1</sup> Technical efficiency however, does not guarantee a situation of a Pareto efficiency. For instance, an economy can be efficient at producing the wrong goods — devoting all available resources to producing left shoes would be a technically efficient use of those resources, but surely some Pareto improvement could be found in which everyone would be better-off.

regarded as a fully employed allocation of the available resources between goods  $x$  and  $y$ . We have now introduced the isoquant maps for good  $x$  (using  $O_x$  as the origin) and good  $y$  (using  $O_y$  as the origin). In this figure it is clear that the arbitrarily chosen allocation  $A$  is inefficient. By reallocating capital and labour one can produce both more  $x$  than  $x_2$  and more  $y$  than  $y_2$ .

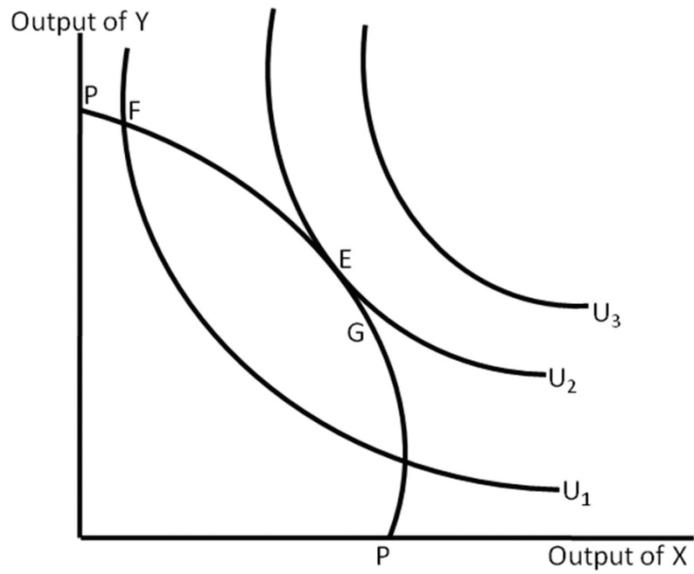
The efficient allocations in Fig. 8.2 are those such as  $P_1, P_2, P_3$ , and  $P_4$ , where the isoquants are tangent to one another. At any other points in the box diagram, the two goods' isoquants will intersect, and we can show inefficiency as we did for point  $A$ . At the points of tangency, however, this kind of unambiguous improvement cannot be made. In going from  $P_2$  to  $P_3$ , for example, more  $x$  is being produced, but at the cost of less  $y$  being produced, so  $P_3$  is not "more efficient" than  $P_2$  — both of the points are efficient. *Tangency of the isoquants for good  $x$  and good  $y$  implies that their slopes are equal. That is, the Rate of Technical Substitution (RTS) of capital for labour is equal in  $x$  and  $y$  production.* The curve joining  $O_x$  and  $O_y$  that includes all of these points of tangency therefore shows all of the efficient allocations of capital and labour. Points off this curve are inefficient in that unambiguous increases in output can be obtained by re-shuffling inputs between the two goods. Points on the curve  $O_xO_y$  are all efficient allocations, however, because more  $x$  can be produced only by cutting back on production of  $y$  and vice versa.

#### 8.2.4 Efficiency in Output Mix

Technical efficiency will not necessarily ensure overall Pareto optimality unless the individuals' preferences are tied up with the production possibilities. *The necessary condition to ensure the Pareto optimum product mix is that goods produced with technical efficient allocation of resources are those which are most demanded by the consumers. Technically, this condition could be achieved when the marginal rate of substitution (MRS) for any two goods by consumers is equal to the rate of product transformation (RPT) of these two goods.* The requirement for efficiency in product mix is illustrated graphically in Fig. 8.3 in one person economy, which could also be applied to an economy of many individuals with identical preferences.

It assumes that one person in this economy produces only two goods ( $x$  and  $y$ ). Those combinations of  $x$  and  $y$  that can be produced are given by the production possibility frontier  $PP$ . Any point on  $PP$  represents a point of technical efficiency. By superimposing the individual's indifference map on the figure, we see that only one point on  $PP$  provides maximum utility. This point of maximum utility is at  $E$ , where the curve  $PP$  is tangent to the individual's highest indifference curve,  $U_2$ . *At this point of tangency, the individual's MRS (of  $x$  for  $y$ ) is equal to the technical RPT (of  $x$  for  $y$ ); hence, this is the required condition for overall efficiency.*

In a single-person economy, the curve  $PP$  represents those combinations of  $x$  and  $y$  that can be produced. Every point on  $PP$  is efficient in a production sense. However, only the output combination at point  $E$  is a true utility maximum for the individual. At  $E$  the individual's MRS is equal to the rate at which  $x$  can technically be traded for  $y$  (RPT).



**Fig. 8.3: Graphical representations of efficiency condition for Optimum Product Mix**

**Check Your Progress 1**

- 1) What is an economically efficient allocation? How does an economically efficient allocation differ from an inefficient allocation?

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- 2) What is the production possibilities frontier? What is the marginal rate of transformation? How does the marginal rate of transformation relate to the production possibilities frontier?

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- 3) What do you mean by the term 'technical efficiency'?

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### 8.3 EFFICIENCY IN A PERFECTLY COMPETITIVE MARKET FIRM

As mentioned in the previous sub-section that there are two versions of efficiency: *productive efficiency* and *allocative efficiency*. By now, it would be clear that productive efficiency means 'doing things right', while allocative efficiency means 'doing the right things'.

A firm is productively efficient when total use of resources (factor inputs) results in the lowest possible cost per unit of output. This would be the point where average total cost is minimized. Any other level of average costs would be sub-optimal. In regards to individual firms, the definition of allocative efficiency is that the individual firm is producing the correct quantity of the right goods – “doing the right things”. *In stating that the correct quantity is produced, in fact, implies that the last unit produced costs (i.e. marginal costs) exactly what the consumer is willing to pay (i.e. the price of unit), resources have been optimally allocated.* Resources have been optimally allocated when there is no waste, i.e. when the price equals marginal cost of the last unit produced. This occurs when the output level is where  $P (AR) = MC$  for the firm. When all firms fulfil this criterion then supply equals demand on the market.

The firm operating within a perfectly competitive market will be both productively and allocatively efficient in the long run. It was proved in Unit-1 that the firm cannot have abnormal profit in the long run due to the entry of new firms, whereby the subsequent increase in supply and lower market price, will dissolve any such profits. Nor can the firm survive endless losses.

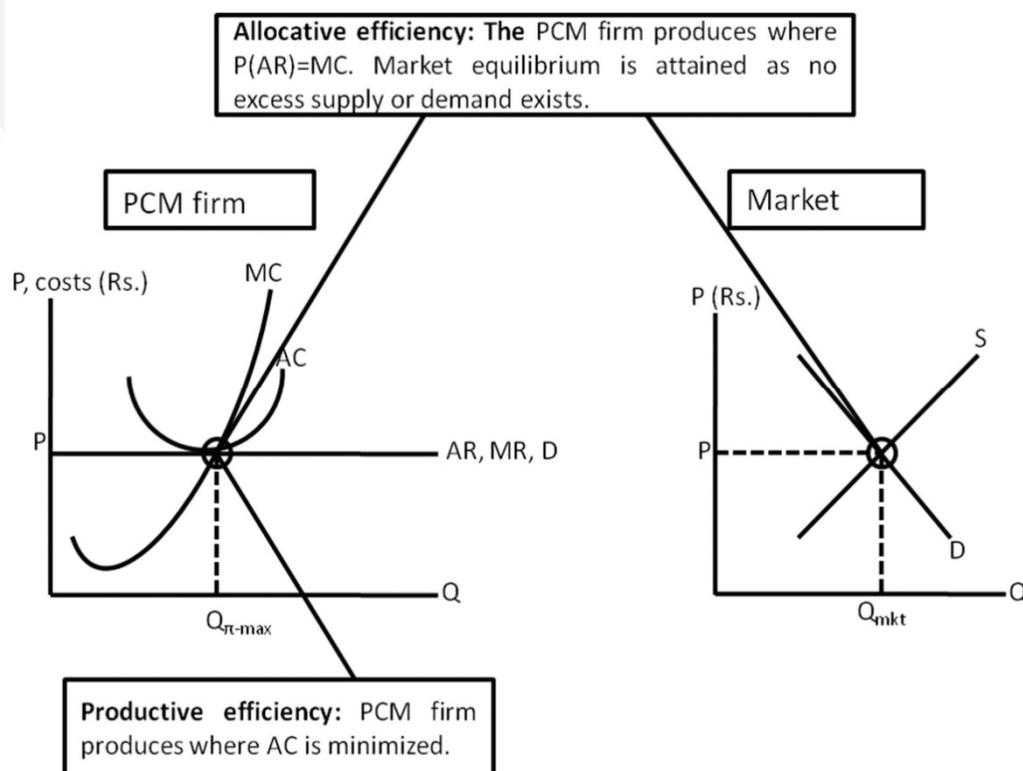


Fig. 8.4: Productive and Allocative Efficiency and LR Equilibrium for a PCM firm

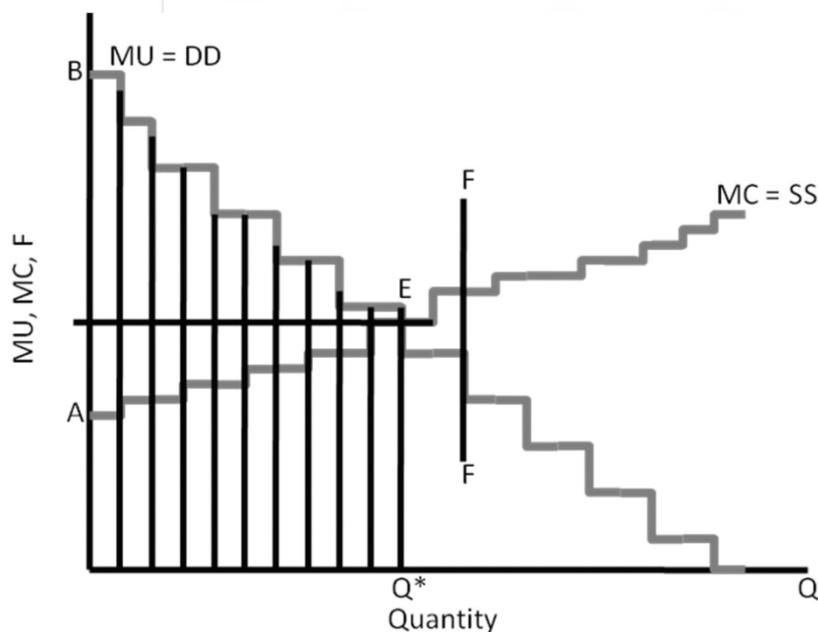
Fig. 8.4 shows the LR equilibrium for a PC firm; output is at  $P = AC_{min} = MC = AR = MR$ .

In sum, we may conclude that the PC firm in the long run produces at an output level where  $P = AC_{\min} = MC = AR = MR$ . This identity fulfils the criteria for both productive and allocative efficiency in the long run, i.e.

- *Productive efficiency*: The LR equilibrium for the perfectly competitive market shows that  $AR = AC_{\min}$ . The firm is productively efficient.
- *Allocative efficiency*: The horizontal demand curve will set output along the upward sloping MC curve, inevitably forcing the firm to produce where the marginal revenue equals the marginal cost. In LR equilibrium,  $P(AR) = MC$ . The firm is allocatively efficient.

## 8.4 EFFICIENCY IN A PERFECTLY COMPETITIVE MARKET ECONOMY

Consider a simplified competitive economy where all individuals are identical and engaged in growing food. Further assume: (a) as per law of diminishing returns, each extra minute of work on fixed land brings less and less extra food, (b) each extra unit of food consumed brings diminished marginal utility (MU). Fig. 8.5 shows supply and demand for our simplified competitive economy.



**Fig. 8.5: Efficiency in Competitive Market**

When we sum horizontally the identical supply curves of our identical farmers, we get the upward-stepping MC curve. As we have seen in Unit 1, the MC curve is also the industry's supply curve, so the figure shows  $MC = SS$ . Also, the demand curve is the horizontal summation of the identical individuals' marginal utility (or demand-for-food) curves; it is represented by the downward-sloping  $MU = DD$  curve for food in Fig. 8.5. The intersection of the SS and DD curves shows the competitive equilibrium for food. At point E, farmers supply exactly what consumers want to purchase at the equilibrium market price. Each person will be working up to the critical point where the declining marginal-utility-of-consuming-food curve intersects the rising marginal-cost-of-growing-food curve.

**ECONOMIC SURPLUS AND EFFICIENCY**

Fig. 8.5 also shows a new concept, **economic surplus**, which is the area between the supply and demand curves at the equilibrium. The economic surplus is the sum of the **consumer surplus**, which is the area between the demand curve and the price line, and the **producer surplus**, which is the area between the price line and the SS curve. The producer surplus includes the rent and profits to firms and owners of specialised inputs in the industry and indicates the excess of revenues over cost of production. The economic surplus is the welfare or net utility gain from production and consumption of a good; it is equal to the consumer surplus plus the producer surplus.

Analysis of the competitive equilibrium will show that it maximises the economic surplus available in that industry. For this reason, it is economically efficient. At the competitive equilibrium at point E, the representative consumer will have higher utility or economic surplus than would be possible with any other feasible allocation of resources. At this point, it is observed as follows:

- a)  $P = MU$ , i.e. consumers choose food purchases up to the amount where  $P = MU$ , implying that every person is gaining  $P$  utils of satisfaction from the last unit of food consumed (util is a unit for measuring the utility or satisfaction).
- b)  $P = MC$ , i.e. as producers, each person is supplying food up to the point where the price of food exactly equals the MC of the last unit of food supplied (the MC here being the cost in terms of the forgone leisure needed to produce the last unit of food). The price then is the utils of leisure-time satisfaction lost because of working to grow that last unit of food.
- c) Putting these two equations together, we see that  $MU = MC$ . This means that the utils gained from the last unit of food consumed exactly equal the leisure utils lost from the time needed to produce that last unit of food. It is exactly this condition – that the marginal gain to society from the last unit consumed equals the marginal cost to society of that last unit produced — which guarantees that a competitive equilibrium is efficient.

The result will remain unchanged even if the model is extended to any number of commodities. In such a generalised case too, the rule remains the same, i.e. utility-maximising consumers spread their ₹ income among different goods until the marginal utility of the last rupee is equalised for each good consumed. Since this marginal utility of money is equal to the price ratios which in turn will be equal to ratio of marginal costs of the corresponding commodities in the perfectly market economy. Thus, under certain conditions, perfect competition guarantees efficiency, in which no consumer’s utility can be raised without lowering another consumer’s utility.

**Check Your Progress 2**

- 1) Define the fundamental role of the marginal cost in achieving efficiency in a perfectly competitive market?  
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2) What role does consumer utility maximisation and firm cost minimisation play in a general equilibrium analysis?

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3) Briefly explain the cost structure of a PCM firm and its relevance in determining the price and output of such a firm?

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### 8.5 COMPETITIVE PRICES AND EFFICIENCY: THE FIRST FUNDAMENTAL THEOREM OF WELFARE ECONOMICS

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The essence of the relationship between perfect competition and the efficient allocation of resources can now be easily summarised as below:

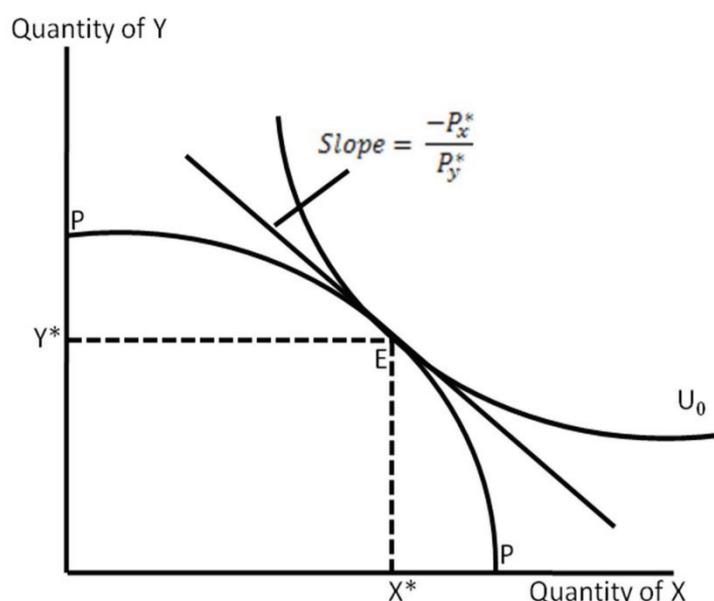
- Attaining a Pareto efficient allocation of resources requires that (except when corner solutions occur) the rate of trade-off between any two goods, say x and y, should be the same for all economic agents. In other words, Marginal Rate of Technical Substitution for all producers and Marginal Rate of Substitution for all consumers should be equal.
- In a perfectly competitive economy, the ratio of the price of x to the price of y, i.e.  $p_x/p_y$  provides this common rate of trade-off to which all agents will adjust. Because prices are treated as fixed parameters both in individuals' utility-maximising decisions and in firms' profit-maximising decisions, all trade-off rates between x and y will be equalised to the rate at which x and y can be traded in the market ( $p_x/p_y$ ), i.e.

$$MRTS_{x,y} = MRS_{x,y} = \frac{p_x}{p_y}$$

- As all agents face the same prices in perfectly competitive market, all trade-off rates will be equalised and an efficient allocation will be achieved. **This is the First Theorem of Welfare Economics.**

The Fig. 8.6 illustrates the efficiency properties of the theorem.

Although all the output combinations on PP are technically efficient, only the combination  $x^*$ ,  $y^*$  is Pareto optimal. A competitive equilibrium price ratio of  $P_x^* = P_y^*$  will lead this economy to this Pareto efficient solution.



**Fig. 8.6: Competitive Equilibrium and Efficiency in Output Mix**

In Fig. 8.6, given the production possibility frontier PP and preferences represented by the indifference curves, it is clear that combination  $x^*$ ,  $y^*$  represents the efficient output mix. Possibly  $x^*$ ,  $y^*$  could be decided upon in a centrally planned economy by the planning board or alternatively, in a competitive market, the self-interest of firms and individuals will also lead to this allocation. Only with a price ratio of  $p_x^*/p_y^*$  will supply and demand be in equilibrium in this model, and that equilibrium will occur at the efficient product mix, E, where  $MRS_{x,y}$  (the slope of indifference curve) and  $MRTS_{x,y}$  (slope of the isoquant) and  $p_x/p_y$  (slope of the budget line) are all equal. The price mechanism ensures not only that production is technically efficient (that output combinations lie on the production possibility frontier) but also that the forces of supply and demand lead to the Pareto efficient output combination.

**This is the First Fundamental Theorem of Welfare Economics.**

The correspondence between competitive equilibrium and Pareto efficiency provides “scientific” support for the laissez-faire position (which is based upon the free market mechanism without intervention of the Government. For example, Adam Smith in his book ‘Wealth of Nations’ asserted in support for such a policy with an example, “it is not the “public spirit” of the baker that provides bread for individuals’ consumption. Rather, bakers (and other producers) operate in their own self-interest when responding to market signals. Individuals also respond to these signals when deciding how to allocate their incomes”. Government intervention in this smoothly functioning process may only result in a loss of Pareto efficiency.

However, it is difficult to draw policy recommendations from such a theoretical analysis that pays so little attention to the institutional details of the real world. The efficiency properties of the competitive system however do provide a benchmark — a place to start examining reasons why competitive markets may fail.

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## 8.6 DEPARTING FROM THE COMPETITIVE ASSUMPTIONS

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You will learn in Unit 9 that various factors distort the ability of competitive markets to achieve efficiency. These include (1) imperfect competition, (2) externalities, (3) public goods, and (4) imperfect information. A brief summary of these categories is given below:

### 8.6.1 Imperfect Competition

“Imperfect competition” includes all those situations in which economic agents exert some power over the market in determining price. A firm that faces a downward-sloping demand curve for its product, for example, will recognise that the marginal revenue from selling one more unit is less than the market price of that unit. Because it is the marginal return to its decisions that motivates the profit-maximising firm, marginal revenue rather than market price becomes the important magnitude. Market prices no longer carry the informational content required to achieve Pareto efficiency.

### 8.6.2 Externalities

The competitive price system can also fail to allocate resources efficiently when there are interactions among firms and individuals that are not adequately reflected in market prices. For example, a firm polluting the air with industrial smoke and other debris. Such a situation is termed an externality: an interaction between the firm’s level of production and individuals’ welfare that is not accounted for by the price system. With externalities, market prices no longer reflect all of a good’s costs of production. There is a divergence between private and social marginal cost, and these extra social costs (or possibly benefits) will not be reflected in market prices. Hence market prices will not carry the information about true costs necessary to establish an efficient allocation of resources.

### 8.6.3 Public Goods

A similar problem in pricing occurs in the case of “public” goods. These are goods, such as public education and public health institutions providing free services, which (usually) have two properties that make them unsuitable for production in markets. First, the goods are non-rival in that additional people can consume the benefits of them at zero cost. This property suggests that the “correct” price for such goods is zero, which obviously a problem for market mechanism to operate. A second feature of many public goods is non-exclusion: no individual can be precluded from consuming the good. Hence, in a market context, most consumers will adopt a “free rider” stance, waiting for someone else to pay. Both of these technical features of public goods pose substantial problems for market economies.

### 8.6.4 Imperfect Information

The efficiency of perfectly competitive pricing is based on the assumption of availability of full information with both producers and buyers in the market. It implicitly assumes that buyers and sellers have complete information about the goods and services they buy and sell. Firms are assumed to know about all the production functions operating in their industry. Consumers are presumed to know about the quality and prices of goods. If this assumption breaks down

and consumers are uncertain about prices and quality of a good and/or firms are unaware of the production processes in the industry, it will be difficult to achieve the efficiency through competitive pricing.

These four impediments to efficiency suggest that one should be very careful in applying efficiency properties of perfectly competitive markets for policy formulation in the arena of public welfare.

**Check Your Progress 3**

1) Explain how the conditions of utility maximisation, cost minimisation, and profit maximisation in competitive markets imply that the allocation arising in a general competitive equilibrium is economically efficient.

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2) State the distortions leading to failure in achieving the efficiency in perfectly competitive market.

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**8.7 LET US SUM UP**

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The efficient allocation of resources requires that the rate of trade-off between any two goods should be the same for all economic agents. In a perfectly competitive economy, the ratio of the prices of the goods produced provides this common rate of trade-off to which all agents will adjust and eventually be equated. The firm operating within a perfectly competitive market will be both productively and allocatively efficient in the long run, i.e. in the long run perfectly competitive market shows that  $AR = AC_{min}$  (the firm is productively efficient) and  $P (AR) = MC$  (The firm is allocatively efficient).

It is, however, very pertinent to note that even though the competitive equilibrium outcome is efficient, there is no guarantee that all consumers fare equally well under the equilibrium. The welfare of an individual consumer depends on his or her endowment of scarce economic resources, which in the societies are not equally distributed. An economy with great inequalities in distribution of endowments is not necessarily efficient. In such a society, the economy might be squeezing a large quantity of guns and butter from its resources. But the rich few may be eating the butter and feeding it to their cats, while the guns are mainly protecting the butter of the rich. A society, therefore, does not live on efficiency alone. A society may choose to alter market outcomes to improve the equity or fairness of the distribution of income and wealth. Nations may levy progressive taxes on those with high incomes and

wealth and use the proceeds to finance food, schools, and health care for the poor.

It was also noted that the term ‘Marginal’ (cost, price, revenue and utility) is a fundamental concept for efficiency.

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## **8.8 REFERENCES**

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- 1) David A. Besanko, Ronald R. Braeutigam and Michael J. Gibbs, *Microeconomics*, 4th Edition, John Wiley and Sons, p. 648-721.
- 2) Kautsoyiannis, A. (1979), *Modern Micro Economics*, London: Macmillan.
- 3) Krister Ahlersten, (2008) *Essentials of Microeconomics*, First Edition, bookboon.com, p. 76-87.
- 4) Sanjay Rode, (2013), *Modern Microeconomics*, First Edition, bookboon.com, p. 173-227.

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## **8.9 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES**

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### **Check Your Progress 1**

- 1) Read Section 8.2 and answer
- 2) Read Sub-section 8.2.1 and answer
- 3) Read Section 8.2 and answer

### **Check Your Progress 2**

- 1) Read Section 8.3 and answer
- 2) Read Section 8.4 and answer
- 3) Read Section 8.4 and answer

### **Check Your Progress 3**

- 1) Read Section 8.5 along with Section 8.3 and Section 8.4 and answer
- 2) Read Section 8.6 and Section 8.7 and answer

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# UNIT 9 EFFICIENCY OF THE MARKET MECHANISM: MARKET FAILURE AND THE ROLE OF THE STATE

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## Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Departures from the Assumptions of Perfect Competition
  - 9.2.1 Imperfect Markets
  - 9.2.2 Externalities
  - 9.2.3 Public Goods
  - 9.2.4 Imperfect Information
  - 9.2.5 Adverse Selection
  - 9.2.6 Moral Hazard
- 9.3 Deviations between Marginal Social Costs & Marginal Private Costs and Social & Private Benefits
- 9.4 Internalising Externalities
  - 9.4.1 Need for Public Interventions
  - 9.4.2 Taxes and Subsidies
  - 9.4.3 Direct Regulation: Administrative Steps
    - 9.4.3.1 Regulating Privately Determined Prices
    - 9.4.3.2 Regulation of Activities
  - 9.4.4 Public Provision: Expanding Supply of Public Goods
- 9.5 Let Us Sum Up
- 9.6 References
- 9.7 Answers or Hints to Check Your Progress Exercises

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## 9.0 OBJECTIVES

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After going through this unit, you will be able to appreciate that in actual practice, the market may suffer from imperfections on account of several factors. In fact there may be unavoidable deviations from the assumptions of perfect competition. So, you will be able to have a fairly good idea about:

- imperfections in the market;
- the problem of externalities;
- the existence of public goods, which have properties of non-exclusion and non-rivalry leading to some external costs/benefits;

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- imperfection of information which vitiates the decision making process;
- the problem of adverse selection and moral hazards in the functioning of different agents/ actors in the market;
- how all the above problems lead to the deviation between social and private marginal costs on the one hand and benefits on the other hand;
- the need for internalising externalities through public interventions which may take form of taxes and subsidies, regulation of privately determined prices.

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## **9.1 INTRODUCTION**

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You have studied in the previous unit that in a perfectly competitive market system, we are able to achieve technological and economic efficiency in allocation of resources among alternative usage and distribution of income among owners of resources. You have also come across 1<sup>st</sup> Welfare Theorem which summed up all these ideas based on Pareto Efficiency. We tend to develop overconfidence in the optimality and desirability of market based solutions to the day to day economic problems of the society on the basis of that narration of Unit 8.

However, now we are turning to an examination of possible departures from the assumptions of perfectly competitive markets. Those assumptions are:

- A very large number of both buyers and sellers;
- Homogenous product;
- Perfect information;
- Free flow of information which is free for both buyers and sellers;
- No barriers to entry into the market or exit there from;
- No body exercises control over the market price through ones own actions; and
- There does not exist any externality.

In the present unit, in Section 9.2, we are going to examine how deviations from the above assumptions create situations which lead the markets away from the path of efficiency and optimality. We give a common name to such situations – the market failure. In that section, we will examine 6 such sets of circumstances. We have kept the treatment elementary. You will study such issues in much greater depth when you pursue a course in economics at a higher and more rigorous level.

The Section 9.3 is devoted to examine of one single consequence of chain of events which leads to failure of “efficiency” of the market mechanism. It is divergence between private and social marginal costs and marginal benefits.

Section 9.4 suggests some approaches to that take care of the factors which lead to externalities – we call it internalising the externalities. Interestingly, one approach to solving the problem is to enhance the provisions of “public goods” – especially in the field of health and education. It is believed by the economists that positive externalities created by the public provision will help the society to minimise the negative externality causing distortions present in the society.

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## 9.2 DEPARTURES FROM ASSUMPTIONS OF PERFECT COMPETITION

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The Unit 8 had introduced you to the implications of perfect competition. In particular, efficiency in production, technical efficiency, efficiency in allocation of different resources among different uses and firms and efficiency in decisions regarding product mix were explained. The “efficiency” in general means “Pareto efficiency”.

We then moved on to describe efficiency in a perfectly competitive market firm and that of a perfectly competitive market economy. This led us to the First Fundamental Theorem of Welfare Economics.

You were briefly introduced to the departure from perfect competition in Section 8.6. The present unit aims at giving you a detailed analysis of what happens when we stray from the idealised situation of perfect competition – what will be, in particular, the implications for efficiency in allocation and distribution, of which particular type of departure.

Here, in this section we will deal with imperfections in the market, positive and negative externalities, effects of existence of public goods, imperfections of information, adverse selection and moral hazards.

### 9.2.1 Imperfect Markets

This occurs with violation of assumption of perfect competition that the number of buyers and sellers in each market is very large. There are situations where some goods are produced and sold by one or fewer seller as well as some goods purchased by few buyers. Following are the examples of each situations:

- a) where some goods are produced and sold by one seller – this is also called monopoly market structure
  - For instance, Indian railways has monopoly in railroad transportation.
  - Electricity boards have monopoly in their respective states.
- b) Where some goods are produced and sold by few sellers. This is also called oligopoly market structure
  - a) Airlines industry has few providers like Jet airways, Air India, Indigo etc.
  - b) Mobile Service Provider like Airtel, Vodafone, Reliance etc.
  - c) Automobile Industry like Honda, Maruti etc.
- c) Where there are a few buyers of product – this is called Oligopsonic market structure
  - a) Agriculture products like cocoa, tea, tobacco has few big buying industries.
  - b) Indian Railways is the only employer for locomotive engineers in the country.

### 9.2.2 Externalities

Externality occurs when the violation of assumptions entail cost or benefit to third parties. Or in other words, one person’s action affects another person’s well-being positively or negatively and the relevant cost or benefits accrued to

another persons are not reflected in market prices. For example, a smoker will enjoy smoking and smoke alone, but other person near to him will be affected by the smoke. Another example: a private function where loud music is played may disturb the peace of neighbourhood.

### 9.2.3 Public Goods

Another major source of inefficiency or market failure lies in the fact that there are some goods which are not in interest of private seller or firms to produce. These goods are usually beneficial for the society but private firms find no reason to produce them. So in other words, Public goods are those goods whose consumption cannot be restricted to only those who pay for them. For instance, road lights will benefit all who use the road, but the exact buyers cannot be identified and charged for it. [Though it has become possible to exclude motorists who do not pay toll-tax on highways]. Another classical example is defense services which protect whole society. These goods and services are called **public goods** or **social goods**.

A public good has two key characteristics: its consumption is non-excludable and non-rival. These characteristics make it difficult for market producers to sell the good to individual consumers.

- **Non-excludability** means that we cannot exclude non-payers from consuming it. For example, defense services at national borders protect whole nation, no one can be excluded from that protection. Opposite to this is an excludable good, if one needs phone services, they have to buy the phone and pay the call charges.
- **Non-rivalry** means that when a person consumes a good, it will not diminish other persons' share. For example, adding one more person in the society available to the existing members of the society. Opposite to this, can be a rival good, say, a Pizza. If one slice of the Pizza is consumed by one person, the share available to the rest will be reduced by that slice.

Table 9.1, provides combinations of non-exclusion and non-rival goods. There are goods which are pure public or pure private good. But there are also goods which are semi public goods, for example, common resources are resources where there are many users but no owner. For example, ocean has no owner and anyone can go for fishing there.

**Table 9.1: Combinations of non-exclusion and non-rival goods**

		Non-Rival	
		Yes	No
Non-Exclusion	Yes	Pure Public goods: national defense, street lights, judicial system	Common resources- farm grazing in villages, fish taken from ocean, irrigation water from river
	No	Toll goods: theaters, toll-tax roads, cable TV	Pure Private goods: Pizza, mobile phones

Public goods have extreme positive externality. One major problem that arises with public good is of 'free riding'. **Free Rider** means a person who is using the good without paying anything for it. There is always some over-consumption of shared resources due to this problem.

### **9.2.4 Imperfect Information**

The second major source of inefficiency or market failure is imperfect information on the part of buyers and sellers. This implies violation of assumption that consumers and producers have full knowledge of product characteristics, available prices etc. Below are few examples to understand the situation of imperfect information:

- a) Second hand vehicle (say car) seller has more information about its quality than the buyer.
- b) In labour market, workers know about their skills, but employers have limited information about the quality of workers to compare.
- c) Insurance agency has less information about the risks taken by their clients, as the risk varies across clients due to the differences in their socio-economic background etc.

### **9.2.5 Adverse Selection**

Adverse selection refers to a market process in which buyer and seller have different access to product information. For example, there are two groups, i.e., smokers and non-smokers for health insurance in the market. As the insurance company cannot differentiate between the two, both groups have to pay the same premium. This health policy is better for smokers. They are likely to die younger than average due to bad effects of smoking. The nonsmoker are at disadvantage as they are paying higher premium, as there exists no policy which will take care of smoking characteristics. So market failure is involved. In simple terms, adverse selection tends to result from ineffective price signals as most information in a market economy is transferred through prices.

### **9.2.6 Moral Hazard**

Moral hazard problem arises when one party to a contract changes behaviour in response to that contract and thus passes the cost of its behaviour on to the other party to the contract. We consider the smoker and non-smoker example again. In normal scenario, smokers have incentive to quit smoking as it increases cost of premium to them. However, smoker knows that a large portion of cost of their risk behaviour will be borne by insurance company and indirectly by non-smoking policy holders. This results in market failure.

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## **9.3 DEVIATIONS BETWEEN MARGINAL SOCIAL COSTS & MARGINAL PRIVATE COSTS AND SOCIAL & PRIVATE BENEFITS**

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Remember, perfectly competitive firms objective is to maximise profits by producing output where price is equal to marginal cost ( $P=MC$ ). In absence of externality, this private marginal cost of firm equals its social marginal cost. However, in presence of externality there are costs (or benefits) that fall on someone else, which are called external costs (or external benefits). These external effects of an activity are in addition to the private costs. The sum total

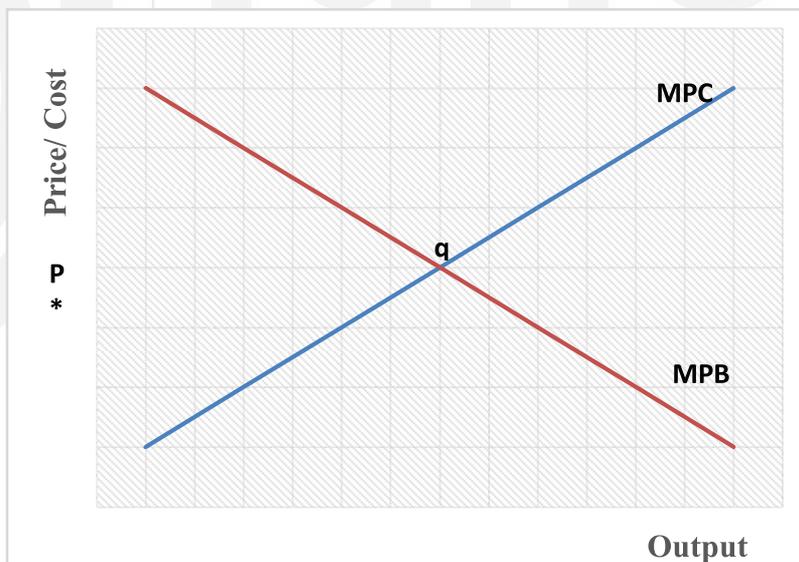
of private and these third party costs is called social costs. The same logic applies to calculation of social benefits.

As you know, the supply curve for a good or service shows marginal cost (MC) to those individuals who are producing it. It shows the lowest prices producers are willing to accept for different quantities of product. In case of externality, we consider it as marginal private cost (MPC). If there are no negative externality associated with the producing it, then it is equal to marginal social cost (MSC). In presence of negative externality, MSC is greater than MPC by amount of marginal external cost (MEC). Marginal external costs (MEC) are cost to third-person or society who are directly not involved in the activity from an extra unit of production. So we can also say that

$$MSC = MPC + MEC$$

From consumer side, the demand curve for a good or service shows marginal benefits (MB) to those individuals who are consuming it. It shows the highest prices consumers are willing to pay for different quantities of product. In absence of externality, we consider it as marginal private benefit (MPB). If there is no positive externality associated with producing it, then it is equal to marginal social benefit (MSB). In presence of positive externality, MSB is greater than MPB by the amount of that marginal external benefit (MEB). MEB shows the benefit to third-person or society who are directly not involved in the activity of consumption of an extra unit. So we can also say that

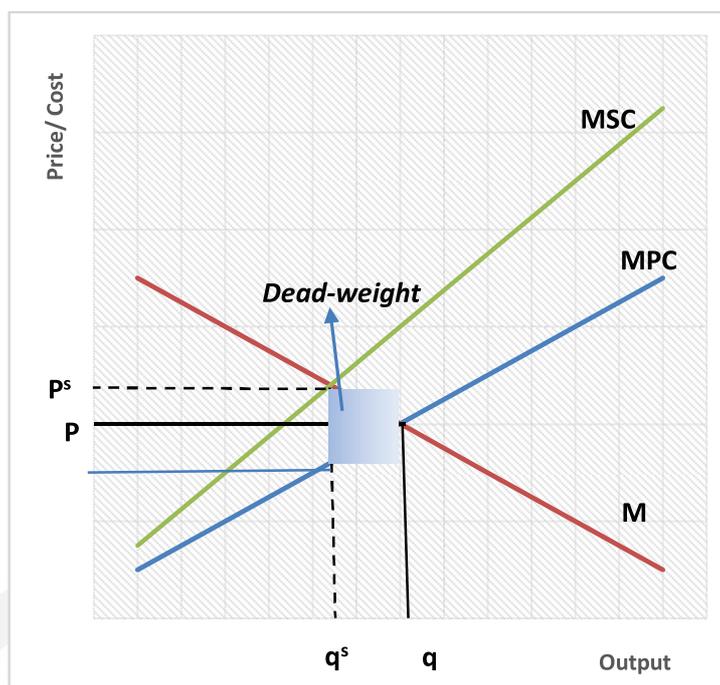
$$MSB = MPB + MEB$$



**Fig. 9.1: Profit maximising market - no externality case**

Fig. 9.1, shows the market equilibrium in presence of no externality. Consumer preferences are depicted by demand curve as shown by marginal private benefit curve (MPB) and producer's production are shown by supply curve or marginal private cost (MPC) curve. The equilibrium quantity of the product is where  $MPB = MPC$ , where optimum level of price and output are  $P^*$  and  $q^*$  respectively. The presence of market failures, i.e. positive or negative externalities will result in market producing either too much or too little of the commodity from society's perspective. Fig. 9.2, presents socially optimal outcome in presence of negative production externality. In presence of external cost, MSC will be higher than MPC. So the MSC curve lies above the supply curve (i.e. MPC) representing the additional external costs. The new

equilibrium will be at a point where price will increase to  $P^s$  from  $P^*$  and output will fall from  $q^*$  to  $q^s$ . The market level of output is inefficiently larger than the output in presence of external cost. This means there is a loss in societal benefit i.e. dead weight loss. Dead-weight loss is the triangle as shown by the shaded area as shown below in Fig. 9.2.



**Fig. 9.2: Profit maximising market-negative externality**

So, with negative externality  $P > MPC$ , hence market inefficiency. The efficiency direction varies with the type of externality. The results of all possible type of externality are as follows:

- Negative production externalities lead to over production (Seller)
- Positive production externalities lead to under production (Seller)
- Negative consumption externalities lead to over consumption (Buyer)
- Positive consumption externalities lead to under consumption (Buyer)

## 9.4 INTERNALISING EXTERNALITIES

Our discussion in Sections 9.2 and 9.3 above leads to an inescapable conclusion: The externalities are simply unavoidable. One reason or the other will lead to such a situation that some external benefits will be conferred on some members of society or some external costs will be imposed on some social group. This implies that the ideal situations visualised in Unit 8 of all around efficiency and optimality is a misnomer – it is never going to come true! But is the situation really so “hopeless”? No. The present section outlines some via-media – we can try to internalise some externalities – that is we can incorporate them in market calculations to reduce the “external” positive or negative elements. We can go to the extent of using creation of some positive externalities to counter-balance the pre-existing negative ones Sub-section 9.4.4. But one thing is absolutely clear – the presence of externalities calls for state-intervention.

### 9.4.1 Need for Public Intervention

As we discussed above, when an activity generates either positive or negative

externality, social optimality of output is affected. Thus in presence of externality, individual (consumer or producer) objective will not result in maximum social welfare, hence an economic rationale for some form of **government interventions** in such situations. The appropriate way is to internalise the externality that exists. Take the producers or consumers that create the externality into account when making policies. The two most common approaches to solve the problem of externality considered are given below:

### **9.4.2 Taxes and Subsidies**

The classic way to adjust for the externalities is to tax those who create externalities. This approach is called Pigouvian Tax. Consider an example: A coal based thermal power plant generates  $q^*$  units of electricity. However, in the process, it pollutes environment imposing negative externalities on the rest of society. So, in addition to private marginal cost of producing electric power, there exist external marginal cost also. The total or social marginal cost is sum of the two ( $MSC = MPC + MEC$ ). In the absence of no social control, the plant operators keeps on increasing power generation and pollution. But what happens if the State imposes a tax equal to marginal external cost? Now, the MPC plus tax will be equal to the MSC. The producer's surplus from excessive power generation will be eliminated. So the socially optimum level of power will be generated.

Consider different situations. Production of a certain item/service is not optimal. Private cost calculations restrict supply to  $q^*$  whereas the consumers will like to consume  $q_c > q_s$ . This can happen when consumption generates additional social benefits, not accounted for in the private calculations. Here, it will be advisable for the state to subsidise the production/distribution/consumption. We can count examples of subsidised sale of essential fertilizer by the state agencies – as higher application of, say, Urea, leads to higher food productions, which is critical for alleviation of hunger and mal-nutrition in the society.

### **9.4.3 Direct Regulation: Administrative Steps**

#### **9.4.3.1 Regulating the Privately Determined Prices**

The price regulation can become an important administrative measure to curb profiteering on part of firms and to make available essential services and commodities to the end users at a reasonable price. Two recent examples from India can be mentioned here: The private (unaided) schools in Delhi did increase the tuition fee charged from the students disproportionately, on the pretext of meeting additional cost on account of the implementation of 6<sup>th</sup> Central Pay Commission Award. Their bluff was called by the Honourable High Court of Delhi and they are ordered to refund the excess amount along with the interest thereon to the pupils. If they fail to do so, the private managements may lose the control over those organisations.

The second example is that of inordinately high prices charged by pharma-suppliers for the medical devices – like stents etc. The government has been forced to impose price ceilings on such devices. Many of essential medicines also attract the price ceilings.

These measures try to eliminate excessive profits only the costs plus a reasonable returns are still being recovered by the manufacturers.

### 9.4.3.2 Regulation of the Activities

**Regulation:** The problem with taxes and subsidies is that the level of tax or subsidy cannot be measured accurately in monetary terms. Another way of controlling externality is to set standard limits for such activities. For example:

- Setting minimum standards for health and safety at the workplace
- Pollution permits: setting maximum quantity of polluting activity and above that, stricter penalties for firms and consumers who break regulations
- Banning cigarette advertising and making workplaces no-smoking environments

Other than these, private bargaining and negotiations by agents are also used to solve the problem of externality.

### 9.4.4 Public Provision: Expanding Supply of Public Goods

Now it is being increasingly realised that the society cannot depend on the market forces to ensure optimum provision of essential services like education, public health and tertiary health services. On account of presence of massive divergence between private cost based calculations of the suppliers and the social needs (signifying huge social benefits), it is being argued that the state must increasingly enter into these two areas.

#### Check Your Progress 1

- 1) What are the assumptions of perfect competition market?  
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- 2) What do you understand by the market failure? Explain the sources of market failures?  
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- 3) How do public and private goods differ?  
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- 4) Explain the policy instruments available for government intervention to regulate inefficient market situations.  
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- 5) Place each of these goods and services in the list below into the four boxes in Table 9.2.  
a) Private parks b) potato chips c) street lights d) Public toll roads &

bridges e) police and fire protection f) grazing land g) fish taken from ocean h) timber i) Army j) Cable television k) mobile phones l) ice-cream m) Public radio n) laptop o) Free Mid-day meal at Public school p) parking spaces

**Table 9.2: Combinations of non-exclusion and non-rival goods**

		Non-Rival	
		Yes	No
Non-Exclusion	Yes		
	No		

## 9.5 LET US SUM UP

We began the unit with narration of some sets of circumstances which essentially are related to breakdown of some assumptions or other of the perfect competition. Then, we demonstrated that this breakdown leads to deviations between private and social costs as well as benefits. Our quest for internalising the phenomena of externalities lead us to work for some public or government interventions, in forms of taxes and subsidies, or regulating minimum /maximum prices, or regulating certain private activities through legal dictates. We go to the extent of using the instruments of the state to generate some such externalities which can possibly mitigate the adverse effects of some pre-existing externality causing maladies.

## 9.6 REFERENCES

- 1) Case, Karl E. & Ray C. Fair, *Principles of Economics*, Pearson Education, Inc., 8th edition, 2007., Chapter 12.

## 9.7 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

### Check Your Progress 1

- 1) See Section 9.1
- 2) See Section 9.2.
- 3) The two characteristics of public goods: non-exclusion and non-rivalry make them different from private good.
- 4) See Section 9.4
- 5) See below

		Non-Rival	
		Yes	No
Non-Exclusion	Yes	Army, street lights, judicial system, police and fire protection, Free Mid-day meal at school	grazing land, fish taken from ocean, timber
	No	Public toll roads & bridges cable television, Public radio, private parks.	potato chips, mobile phones, laptop, ice-cream, cloths, parking spaces

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## GLOSSARY

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- Allocative Efficiency** : Producing goods and services demanded by consumers at a price that reflect the marginal cost of supply.
- Abnormal Profit** : Profit in excess of normal profit - also known as supernormal profit or monopoly profit. Abnormal profits may be maintained in a monopolistic market in the long run because of barriers to entry.
- Adverse Selection** : When one party to a deal is making suboptimal choice because of asymmetry in information.
- Collusive Behaviour** : In collusive oligopoly industry contains few producers wherein producers agree among one another as to pricing of output and allocation of output among themselves. Cartels, such as OPEC, are collusive oligopolies.
- Cournot Model** : The Cournot model of oligopoly assumes that rival firms produce a homogenous product, and each attempts to maximise profits by choosing how much to produce. All firms choose output (quantity) simultaneously.
- Cartel** : An association of manufacturers or suppliers with the purpose of maintaining prices at a high level and restricting competition.
- Common Resources** : These are resources where there are many users but no owner.
- Comparative Advantage** : A country has a comparative advantage in producing a good 'A' if the cost of producing 'A' is lower at home than in the other country.
- Derived Demand** : Refers to demand for factors of production as their demand is derived from the demand for goods and services.
- Economic Profit** : A firm's revenues less its economic cost.
- Economic Cost** : The economic cost includes the accounting cost and the opportunity cost of the factor of production in its next best alternative use.
- Excess Capacity** : **Excess capacity** is a situation in which actual production is less than what is achievable or optimal for a firm. This often means that the demand for the product is below what the business could potentially supply to the market.
- Economic Rent** : Refers to payment for the use of something which is fixed in supply.

- Externalities** : Externalities occur in an economy when the production or consumption of a specific good impacts a third party that is not directly related to the production or consumption.
- Efficient Allocation of Resources** : That combination of inputs, outputs and distribution of inputs, outputs such that any change in the economy can make someone better off (as measured by indifference curve map) only by making someone worse off (Pareto efficiency).
- Free Rider** : It means one person is using the benefits of a good without paying anything for it.
- Factor Endowments** : A country's endowments of resources like land, labour, capital etc.
- Interest** : Refers to payment for the use of capital. Interest is paid for man made goods which are used for production of goods and services.
- Imperfect Competition** : Imperfect competition exists whenever a market, hypothetical or real, violates the abstract tenets of neoclassical pure or perfect competition
- Imperfect Information** : Imperfect information is a situation in which the parties to a transaction have different information, as when the seller of a used car has more information about its quality than the buyer. In other words, a situation when information about the goods and services available to buyers' and sellers are not symmetric.
- Indifference Curve or Utility Frontier** : An indifference curve represents a series of combinations between two different economic goods, between which an individual would be theoretically indifferent regardless of which combination he received.
- Isoquants** : The isoquant curve is a graph that charts all input combinations that produce a specified level of output.
- International Trade** : The trade that takes place between buyer and seller of two different nations is called international trade.
- Long Run** : The time period when all inputs including plant capacity are variable.
- Labour Union** : A recognised organisation of workers that seeks protection of their rights.
- Monopoly** : A firm that is the sole seller of a product without close substitutes.

<b>Monopolistic Competition</b>	: There are a large number of firms that produce differentiated products which are close substitutes to each other. In other words, large sellers sell the products that are similar, but not identical and compete with each other on other factors besides price.
<b>Marginal Physical Product</b>	: Change in quantity produced as one additional unit of the variable factor keeping all other factors constant.
<b>Marginal Revenue Product</b>	: Marginal physical product multiplied by marginal revenue.
<b>Minimum Wage Act</b>	: Government law which fixes the minimum level of wages payable.
<b>Marginal Rate of Substitution</b>	: The marginal rate of substitution is the amount of a good that a consumer is willing to give up for another good, as long as the new combination of the two goods is equally satisfying. It's used in indifference theory to analyse consumer behaviour.
<b>Marginal Rate of Technical Substitution</b>	: The marginal rate of transformation or technical substitution is the rate at which one good must be sacrificed in order to produce a single extra unit (or marginal unit) of another good, assuming that both goods require the same scarce inputs. The marginal rate of transformation is tied to the production possibilities frontier (PPF), which displays the output potential for two goods using the same resources.
<b>Market Imperfection</b>	: Conditions in market which are not conclusive to perfect competition.
<b>Moral Hazard</b>	: Deliberate concealment of some information from the other party.
<b>Market Failure</b>	It refers to failure of market mechanism to achieve efficient allocation of resources in the economy.
<b>Mercantilism</b>	: It is the trade theory which postulates that countries should encourage export and discourage import. The theory argues that a nation should increase export and reduce import and export is the only way to accumulate wealth.(in terms of precious metals like gold).
<b>Normal Profits</b>	: Normal Profit is an economic condition occurring when the difference between a firm's total revenue and total cost is equal to zero. Simply, normal profit is the minimum level of profit needed for a company to remain competitive in the market.
<b>Non Collusive Behaviour</b>	: Oligopoly is best defined by the actual conduct (or behaviour) of firms within a market. The

- concentration ratio measures the extent to which a market or industry is dominated by a few leading firms. When these firms agree to behave in a particular manner it is said to be collusive behaviour of oligopoly market.
- Non-exclusion** : It means that we cannot exclude non-payers from consuming it.
- Non-rival** : It means that when person consume a good, it will not diminish other person's share.
- Oligopoly** : A state of limited competition, in which a market is shared by a small number of big producers or sellers.
- Optimal Output Mix** : The optimal mix of output is known in economics as the most desirable combination of output attainable with available resources, technology, and social values.
- Perfectly Competitive Market** : A market is perfectly competitive if it consists of many consumers and firms, none of whom have any appreciable market share, all firms produce identical products, and there are no barriers to entry or exit, and consumers have perfect information about prices.
- Price Discrimination** : When a firm charges different prices to different groups of consumers for an identical good or service, for reasons not associated with costs, it is termed as price discrimination.
- Product Differentiation** : The marketing of generally similar products with minor variations that are used by consumers while making a choice.
- Prisoner's Dilemma** : A situation in which two players each have two options whose outcome depends crucially on the simultaneous choice made by the other, often formulated in terms of two prisoners separately deciding whether to confess to a crime.
- Profits** : Are returns to entrepreneurs for use of their organisation and management skills in the production process, as well as bearing risks.
- Productive Efficiency** : Production efficiency is an economic level at which the economy can no longer produce additional amounts of a good without lowering the production level of another product. This happens when an economy is operating along its production possibility frontier.
- Production Possibility Curve** : A graphical representation of the alternative combinations of the amounts of two goods or services that an economy can produce by transferring resources from one good or service to the other. This curve helps in determining what quantity of a nonessential good or a service an

	economy can afford to produce without jeopardising the required production of an essential good or service.
<b>Public Goods</b>	: A public good is a product that one individual can consume without reducing its availability to another individual, and from which no one is excluded. Economists refer to public goods as "non-rivalrous" and "non-excludable."
<b>Price Ratio or Relative Price</b>	: Price of a commodity as it compares to another. The relative price is usually presented as a ratio between the two prices.
<b>Public Interventions</b>	: Actions of the government in the markets for goods, services and factors.
<b>Public Provision</b>	Direct supply of certain socially desirable services /goods by the government authorities/agencies to the end users.
<b>Price Ceiling</b>	It occurs when the government puts a legal limit on how high the price of a product can be.
<b>Quasi Rent</b>	: Return to a factor of production over and above its average cost; it is a short-run concept.
<b>Rent</b>	: Refers to payment for the use of land. Land refers to all natural resources available for the purpose of production.
<b>Short Run</b>	: The time period when at least one of the inputs (size of the plant) is fixed.
<b>Supernormal Profit</b>	: A firm earns supernormal profit when its profit is above that required to keep its resources in their present use in the long run i.e. when price > average cost.
<b>Stackelberg Model</b>	The Stackelberg leadership model is a strategic game in economics in which the leader firm moves first and then the follower firms move sequentially. ... There are some further constraints upon the sustaining of a Stackelberg equilibrium.
<b>Transfer Earnings</b>	: Minimum payment to be made to a factor of production to retain it in present employment. It refers to the earnings in the next best employment.
<b>Wages</b>	: Refers to payment for the use of labour which refers to the human effort made for production of goods and services through technical expertise or manual labour.
<b>VMP</b>	: Value of Marginal product, i.e. price times the marginal product of factor.

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## SOME USEFUL BOOKS

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- 1) Kautsoyiannis, A. (1979), *Modern Micro Economics*, London: Macmillan.
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- 3) Pindyck, Robert S. and Daniel Rubinfeld, and Prem L. Mehta (2006), *Micro Economics*, An imprint of Pearson Education.
- 4) Case, Karl E. and Ray C. Fair (2015), *Principles of Economics*, Pearson Education, New Delhi.
- 5) Stiglitz, J.E. and Carl E. Walsh (2014), *Economics*, viva Books, New Delhi.



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