

# Economics for Managers



# **MODULE 1**

## **INTRODUCTION TO MANAGERIAL ECONOMICS**

- **Introduction to Economics**
- **Kinds of Economic Decisions**
- **Significance and applicability of Managerial Economics in decision making**
- **Role and responsibilities of Managerial Economics**
- **Economic principles relevant to managerial decision making**
- **Opportunity cost**
- **Production possibility curve**
- **Concept of increments and Margin**
- **Discounting principle**
- **Theory of firm**

# Economics-Definition

- Lionel Robbins' most famous book was ***An Essay on the Nature and Significance of Economic Science***, one of the best-written prose pieces in economics.
- “Economics is the science which studies human behavior as a relationship between **given ends and scarce means** which have alternative uses.”
- Alfred Marshall , ***In Principles of Economics***.
- Economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of wellbeing.

# What is Economics ?



- Economics is the study of how societies use scarce resources to produce valuable commodities and distribute them among different people.
- Helps in understanding how limited resources can be used to satisfy unlimited wants.

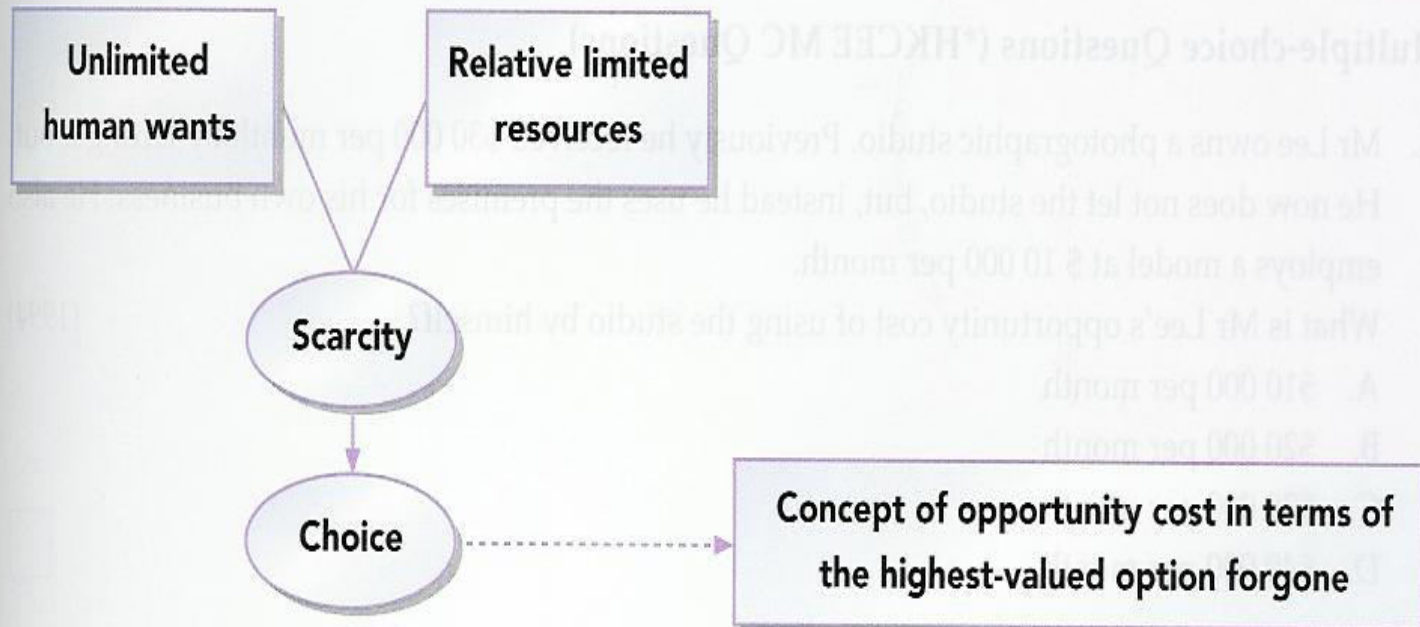
# The focus of economics

Focus of economics –

- ***Resources are always scarce*** when compared to the needs .
- ***Optimum utilization*** of the existing resources.
- Assesses the **relationship between the consumption and production** of goods and services in an environment of finite resources.
- Helps in understanding how **economic agents** behave or interact both **individually (microeconomics)** and **in aggregate (macroeconomics)**.
- **Microeconomics** examines the **behavior individual consumers and firms within the market**.
- **Macroeconomics** analyzes the **entire economy and the issues** affecting it. **Primary focus** areas are **unemployment, inflation, economic growth, and monetary and fiscal policy**.



# CONCEPT MAP



# Economic Problems

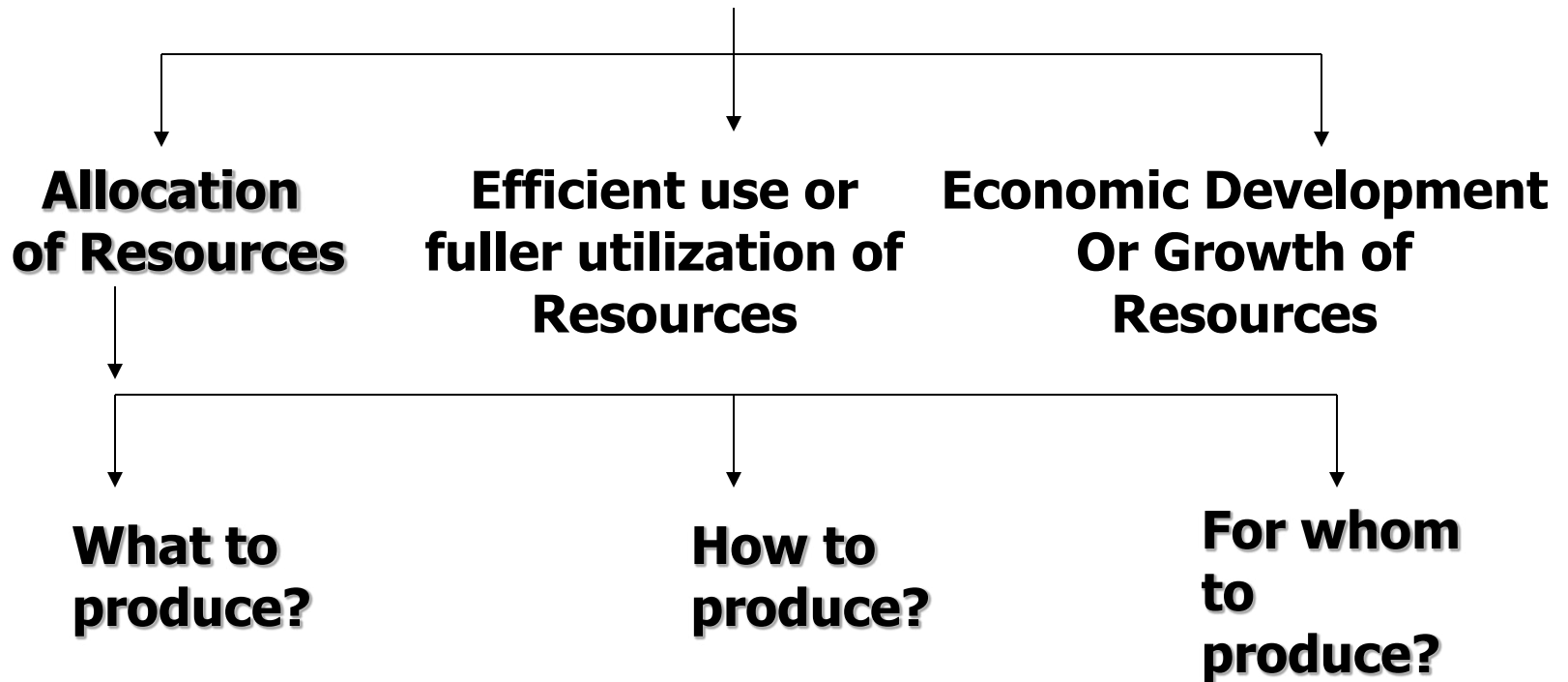
The problem of *choice making* arising out of **limited means of resources and unlimited wants** is called ***economic problem***.

Why do economic problems arise?

- Unlimited wants
- Different priorities
- Limited means/resources
- Means/Resources having alternative uses.

# Basic or Central Problems

## Three Basic or Central Problems of Economy



# Economic Problems

Because of scarcity, all economic choices can be summarized in big questions about the goods and services a society should produce. These questions are:

- What to produce?
- How to produce?
- For whom to produce?

## What to Produce?

The first question every society faces is what to produce. Should a society build more roads or schools? Because of scarcity, society cannot build everything it wants. Choices have to be made. Once a society determines what to produce it then needs to decide how much should be produced. In a market economy the "what" question is answered in large part by the **demand of consumers?**

# Economic Problems

## How to Produce?

The next question a society needs to decide after what to produce is how to produce the desired goods and services. Each society must **combine available technology with scarce resources** to produce desired goods and services. The education and skill levels of the citizens of a society will determine what methods can be used to produce goods and services. For example, does a nation possess the technology and skills to pick grapes with a mechanized harvester, or does it have to pick the grapes by hand?

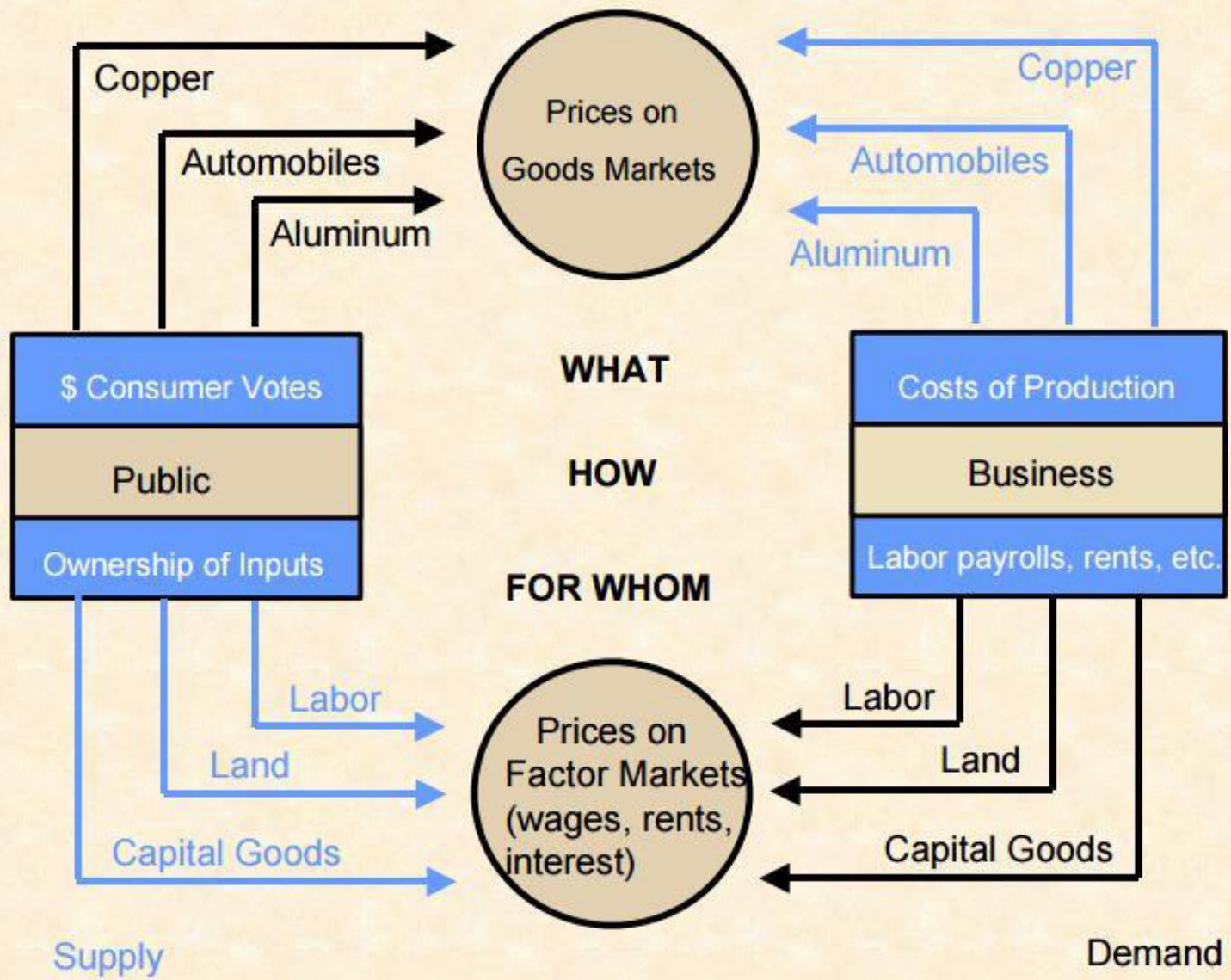
# Economic Problems

## **For whom to produce?**

The final question each society needs to ask is for whom to produce. Who is to receive and consume the goods and services produced? Some workers have higher incomes than others. This means more goods and services in a society will be consumed by these wealthy individuals, and less by the poor. Different groups will benefit from the different ways that we choose to spend our money.

Demand

Supply



**WHAT**

**HOW**

**FOR WHOM**

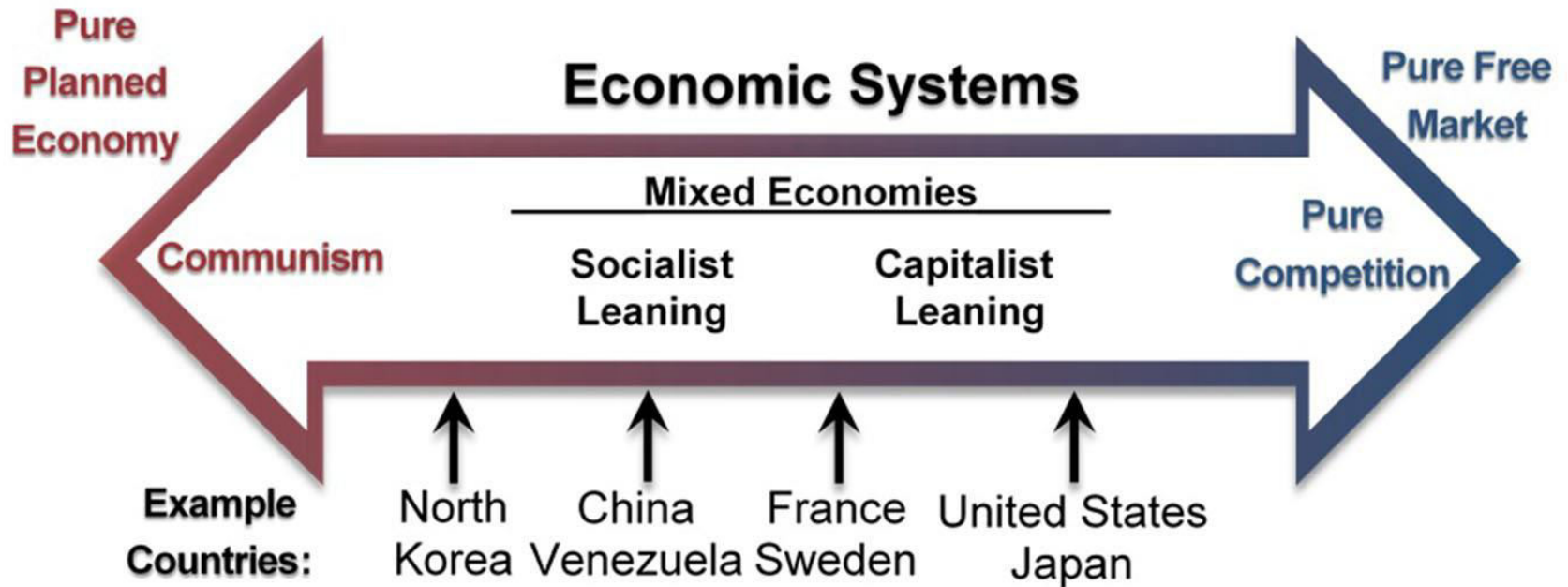
Economic system

# Meaning of economic system

- ▶ **Economy** is an **organisation of economic activities** which provides people with the means to work and earn a living.
- ▶ **Economic system** is defined as an **arrangement** by which the **central problems of an economy** are solved.

# Types of economic systems

- ▶ 1. Capitalist Economy or Free Market Economy.
- ▶ 2. Socialist Economy or Command Economy.
- ▶ 3. Mixed Economy.



# 1.Capitalist Economy or Free Market Economy

- ▶ Capitalism is a **political economic system** based on **private property and private profit**.
- ▶ The private actors own and control property in accord with their interests.
- ▶ In this system **prices are determined** by the market forces of **demand and supply**.
- ▶ This type of system is also called ***laissez-faire*** or **free market economy**.

# Features of Capitalist Economy

1. Private ownership of property.
2. Freedom of enterprise.
3. Profit motive of production.
4. Price mechanism guides production decision.
5. Existence of competition
6. Consumers are supreme.
7. Very unequal distribution of income.
8. Absence of role of Government.

# Capitalism

## Advantages

- Automatic Working
- Higher Efficiency and Incentive to Hard Work
- Higher Rate of Capital Formation
- Economic Development and Prosperity
- Optimum utilisation of resources
- Democratic
- Encouragement to Enterprise and Risk-taking

## Disadvantages

- Wasteful Competition
- Human Welfare ignored
- Economic Instability and Unemployment
- Property Rights take precedence over Human Rights
- Class-Conflict
- Social Injustice and Economic Inequality
- Misallocation of Resources
- Emergence of Monopolies and Concentration of Economic power
- Malpractices in Recent Years

## 2. Socialist economy or Command Economy

- ▶ **Socialism** is a **populist economic and political system** based on **public ownership** (also known as **collective or common ownership**) of the **means of production**.
- ▶ It is a **planned or command economy** based on **public ownership of property and social welfare motive**.
- ▶ **Prices** are determined by **central planning authority**.
- ▶ Some of the socialist countries are North Korea, Cuba, Hungary, Poland, Bulgaria etc.

## Pros of Socialism

1. Inclusive growth. Every person will have equal resources.
2. No monopoly of corporates.
3. Distribution of wealth
4. Reduce discrimination and also makes society classless.
5. Government controls the resource distribution
6. Less conflict in people.
7. It gives everyone an opportunity to pursue success.
8. It reduces the threat of economic cycles.  
(like great recession)

## Cons of Socialism

1. Much control in the hands of government.
2. Research and technological development have less efficiency.
3. People have to give higher taxes.
4. Lack of motivation in citizens.
5. Low competitiveness in market
6. Results into spending of resources where government wants.
7. Buerocratic structure affects efficiency.

# Features of socialist economy

1. Public ownership of property or factors of production.
2. No freedom of enterprise
3. Social welfare motive.
4. Planning mechanism guides production.
5. No competition.
6. Absence of consumer's sovereignty.
7. Restriction on freedom of occupation.
8. Inequalities of income greatly reduced.

# 3. Mixed Economy

- ▶ **A mixed economic system is a system that combines aspects of both capitalism and socialism.**
- ▶ **A mixed economic system protects private property and allows a level of economic freedom in the use of capital, but also allows for governments to interfere in economic activities in order to achieve social aims.**
- ▶ **India is a mixed economy.**

# Features of Mixed Economy

1. Coexistence of public and private sector is the main feature.
2. Coexistence of Capitalist and Socialist Features.
3. Economic Planning.
4. Regulation and Control of Private Sector.
5. Promotion of Social Welfare.
6. Price Mechanism.
7. Profit Motive

# Pros and Cons of Mixed Economy

- Pros

- State provides the essential services
- Private sector encouraged for profits
- Competition keeps prices low
- Consumer choice
- Inefficient business behavior controlled

- Cons

- Heavy taxes reduce incentives to work hard or make profits
- Less efficient than private sector
- Excessive control over business activity can add costs and discourage enterprise

# Micro & Macro Economics

# Micro economics

- **Microeconomics** is the study of particular firms, particular households, individual prices, wages, incomes, individual industries, particular commodities etc.
- **Microeconomic theory** provide the frame work with in which the economist **describes and analyses the behaviour patterns and interrelationship** of the elementary economic units like *consumers, firms, industries, commodities, and markets.*

The main objective of microeconomic theory is to **explain and predict how production, exchange and distribution of goods and services responds** to the **incentive structure** operating in a given society. It is concerned with,

- Theory of demand
- Theory of production and cost
- Factorprice-Theory of distribution
- Theory of economic welfare

# Macroeconomics

- **Macroeconomics** deals with variables influencing the **aggregate volume of the output of an economy** with the extent to which its **resources are employed** with the **size of the national income** and with the **general price level**.

➤ Macroeconomics deals not with individual quantities but with **aggregate of these quantities**, not with the individual income but with the **national income**, not with the individual prices but with **price levels**, not with individual outputs but with the **national output**.

- It studies the following,
  - National income
  - Full employment
  - Utilization of economic resources
  - Aggregate saving and investment
  - Price level
  - output of firm

## Micro Economics

1. It studies the individual unit.
2. Laws related to Marginal analysis are included in its scope.
3. Micro Economics provides the information relating to the individual prices, individual consumption and production.
4. Micro economics analysis is simple
5. Micro economics particularly focus on price analysis.
6. Micro economics studies individual problems and it is less important for comparative study

## Macro Economics

1. It studies the whole economy or large groups.
2. Problems related to whole economy like employment, public finance, national income etc. are included in its scope
3. Macroeconomics provides the information relating to National Income, total output, total consumption and general price level
4. Macroeconomics is complex due to the study of large groups.
5. Macro Economics particularly focus on income analysis
6. Macroeconomics studies the problems relating to the economy and its importance is growing.

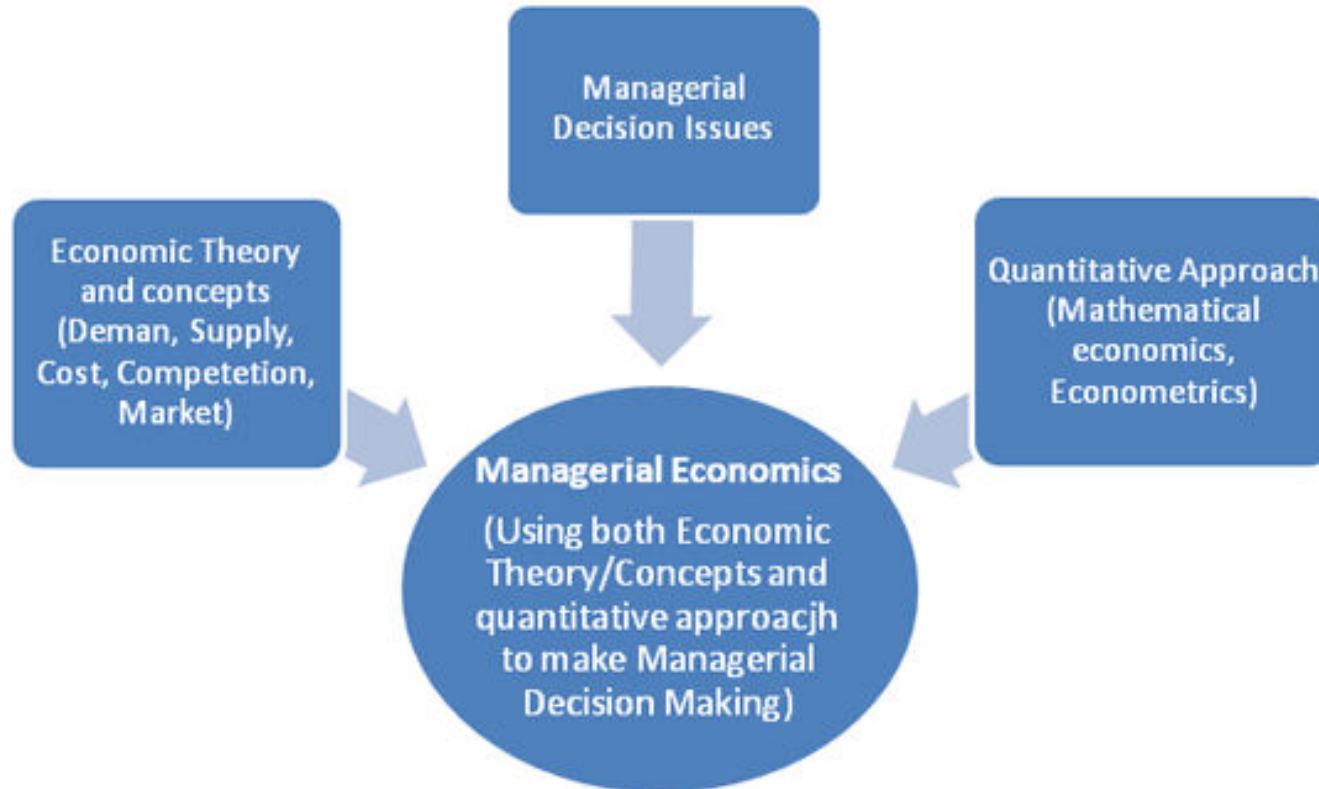
# INTRODUCTION OF MANAGERIAL ECONOMICS

Managerial economics borrows **theories from traditional economics** i.e. microeconomics, where as it borrows **tools from decision science** i.e. mathematics and statistics and it tries to find out optimum solution of business problems.

Thus **Spencer and Seligman** defined Managerial *economics* as ***“The integration of economic theory and business practice for the purpose of facilitating decision-making and forward planning by management.”***

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Concept of Managerial Economics (contd.)



# INTRODUCTION OF MANAGERIAL ECONOMICS

## Origin of Managerial Economics

Like every other individual, a manager of a business firm has to take decisions in the face of *scarcity and alternative uses of resources*. In fact **success of a business firm largely depends upon the efficiency in utilization of limited resources remaining in the disposal of the business firm.**

**The development of managerial economics as a separate discipline has a recent origin. Joel Dean's book Managerial Economics published in 1951 is taken as the pioneer in this discipline.**

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Features of Managerial Economics

Commonly agreed characteristics of managerial economics are :

i. **Microeconomics character:** - Managerial economics is **microeconomics in character** because its unit of study is firm. However, it always takes the **help of macroeconomics to understand and adjust to the environment** in which the firm operates.

ii. **Choice and Allocation:** - Managerial economics deals with **identification of economic choices and allocation of scarce resources** on the best alternative.

iii. **Goal Oriented:** - Managerial economics discusses about **how decisions by managers** help in achieving the organizational goals.

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Features of Managerial Economics (contd.)

- iv. **Conceptual and Metrical:** - Managerial economics is a **rational/logical application of quantitative techniques** to business decision-making . It considers the **nature of the problem to be solved** and thus provides necessary **conceptual tools** to support decision making.
  
- v. **Pragmatic:** - Managerial economics is **more practical than traditional economics**. Hence, it is called **applied microeconomics**. It ignores the complex concepts of the traditional economics.
  
- vi. **Normative:** - Managerial economics belongs to normative economics rather than positive economics. ***Positive economics* studies economic behavior without making judgments. Normative economics, on the other hand, makes value judgments and prescribes what should be done to solve economic problems.**
  
- vii. **Multi-disciplinary:** - Managerial economics is an integration of different academic disciplines.

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Scope of Managerial Economics

Managerial economics can be used to **explain and understand almost all business problems**. Though it has late origin, due to applicability nature this subject is turned to be an area continuous research and innovation. Thus there is no unanimous way of explaining scope of managerial economics.

The most common way is explaining its areas of study, which covers all those economic concepts, theories and tools of analysis which can be used to **analyze issues** related to *demand projection, production and cost, market structure, level of competition and general environment*. *Mostly, these topics are rooted in economic theory* (i.e., micro- and macro economics).

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Scope of Managerial Economics (contd.)

Microeconomics Applied to Operational Issues:

**Operational issues** of firms are of **internal nature**. Internal issues include all those **problems which arise within** the business organization and fall within the control of the management. Some of the basic internal issues are:

- a) Choice of business and the nature of products, that is, *what to produce*,
- b) Choice of size of the firm, that is, *how much to produce*,
- c) Choice of technology, that is, *choosing the factor-combination*  
(technique of production)
- d) Choice of price, that is, *how to price the commodity*,
- e) How to promote sales,
- f) How to face competition,
- g) How to decide on new investments,
- h) How to manage profit and capital,
- i) How to manage an inventory, that is, stock of both finished goods and raw materials.

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Scope of Managerial Economics (contd.)

Microeconomics Applied to Operational Issues:

The following microeconomic theories deal with most of these questions.

- a) **Demand Analysis and Forecasting:** - An understanding of the **forces behind demand** is a powerful tool for managers. *Such knowledge provides the background needed to make pricing decisions, forecast sales and formulate marketing strategies.* A forecast of future sales is essential before employing resources.
- b) **Theory of Production and Production Decisions:** - Production theory explains the **relationship between inputs and output**. It also explains under **what conditions costs increase or decrease; how total output behaves when use of inputs is changed; and how can output be maximized from a given quantity of resources**. Thus, it helps the managers in determining the **size of the firm, and the amount of capital and labour to be employed** keeping in view the objectives of the firm.

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Scope of Managerial Economics (contd.)

Microeconomics Applied to Operational Issues:

- c) **Market Structure and Pricing Theory:** - Price theory explains **how prices of outputs and inputs are determined** under different market conditions; **when price discrimination is desirable, feasible and profitable; and to what extent advertising can be helpful in expanding sales** in a competitive market. Hence, price theory can be helpful in determining the price policy of the firm.
  
- d) **Analysis of Cost:** - Estimates of cost are essential for planning. The **factors determining costs are not always known or controllable which gives rise to cost uncertainty**. Factors of production are scarce and they have alternative uses. **Factors of production may be allocated** in a particular way **to get maximum output**. Thus the **analysis of costs and their links to output** are also importance in managerial economics.

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Scope of Managerial Economics (contd.)

Microeconomics Applied to Operational Issues:

e) **Profit and Capital Management (Investment Decisions):** - Profit provides the **index of success** of a business firm. Profit analysis is difficult, because the **uncertainty of expectations makes realization of profit planning and measurement difficult** . Thus profit management is very important.

**Capital management** means **planning and control of capital expenditures**. Hence, it is very important for a firm to manage required capital through proper investment planning. The main topics covered are: **cost of capital, types of investment decisions, and evaluation and selections of investment projects**.

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Scope of Managerial Economics (contd.)

Microeconomics Applied to Operational Issues:

- f) Inventory Management:** - Inventory refers to a stock of raw materials or finished goods which a firm keeps. Management of inventory is very important for a firm to **keep its current production and supply capacity intact and to meet the challenges arising from change in market and other conditions.** In this regard, a major question that arises is: *how much of the inventory is the ideal stock? If it is high, capital is unproductively tied up, and that might be useful for other productive purposes if the stock of inventory is reduced. On the other hand, if the level of inventory is low, production will be hampered. Hence, managerial economics uses different methods which are helpful in minimizing the inventory cost.*

# INTRODUCTION OF MANAGERIAL ECONOMICS

## Scope of Managerial Economics (contd.)

### Macroeconomics Applied to Business Environment:

Macroeconomic issues relate to the **general business environment** in which a business operates. The factors which constitute economic environment of a country include the following.

- a. Types of economic system in the country;
- b. General trends in national income, employment, prices, saving and investment, etc;
- c. Trend in labour supply and strength of the capital market;
- d. Government's economic policies: industrial policy, fiscal policy, monetary policy, price and foreign trade policies;
- e. Social factors like value system of the society, property rights, customs and habits;
- f. Socio-economic organization like trade unions, consumers' associations, and producers' unions
- g. The degree of globalization of the economy and the influence on the domestic markets.

# Uses and Significance of Managerial Economics in Business Decision Making

Every management system is related with decision-making. Decision-making requires a balance between simplification of analysis of management problems and complications of handling a numbers of factors and tools to attain predetermined objectives. In this context managerial economics occupies important place. The uses or significance of managerial economics can be outlined as:

- i. **Provide Tools and Techniques:** It selects those **economic theories, concepts, and techniques of analysis**, which have a **bearing on the decision-making process**. These are, if necessary, **modified with a view to enable the manager take better decisions**. Thus, managerial economics accomplished the objective of building a suitable tool kit from traditional economics.

# Uses and Significance of Managerial Economics in Business Decision Making (contd.)

- ii. **Adopts Ideas from Other Subjects:** Managerial economics also takes the aid of other academic disciplines having a bearing upon the business decisions of a manager in view of the various explicit and implicit constraints subject to which resource allocation is to be optimized.
- iii. **Decision Making:** Managerial economics helps in reaching a variety of business decisions in a complicated environment such as *what to produce, what inputs and production techniques should be applied, how much output should be produced and at what prices it should be sold, what should be the product-mix*, what are the best sizes and locations of new plants, when should equipment be replaced and how should the available capital be allocated, etc.

# Uses and Significance of Managerial Economics in Business Decision Making (contd.)

- iv. **Managerial Competency:** Managerial economics makes a manager a more competent model builder. Thus s/he can capture the essential relationship, while leaving out the cluttering details and peripheral relationships. It means managerial economics helps in model building depicting the relationship between essential variables.
- v. **Serve as an Integrating Agent:** *When size of a firm expands its activities are undertaken by more specializing departments or functional areas like finance, marketing, personnel, production, etc.* Managerial economics serves as an **integrating agent by coordinating the different areas**. The significance of which lies in the fact that the functional departments often enjoy considerable autonomy and aspire conflicting goals, and coordination of goals of different units, which is must to achieve the goals of the firm as a whole.

# Basic Concepts that aid Decision Making:

- a) Incremental Concept
- b) Discounting concept
- c) Opportunity cost concept
- d) Time concept
- e) Equi-marginal concept

## A). Incremental Concept

Incremental means additional. Impact of **decision alternatives on cost and revenues**. The two fundamental concepts-

1. Incremental cost. 2. Incremental revenue

This principle wants to stress that a decision is sound or valid, when

- it increases revenue more than costs;
- it decreases some costs to a greater extent than it increases others;
- it increases some revenues more than it decreases others; and
- it reduces costs more than revenues.

Suppose a firm gets an order that brings additional revenue of Rs 3,000. The cost of production from this order is:

- Rs
- Labour 800
- Materials 1,300
- Overheads 1,000
- Selling and administration expenses 700
- Full cost 3,800

- At a glance, the order appears to be unprofitable. But suppose the firm has some idle capacity that can be utilised to produce output for new order. There may be **more efficient use of existing labour and no additional selling and administration expenses** to be incurred. ***Then the incremental cost to accept the order will be:***
  - Rs
  - Labour 600
  - Materials 1,000
  - Overheads 800
  - Total incremental cost 2,400
- Incremental reasoning shows that the firm would earn a net profit of Rs 600 (Rs 3,000 – 2,400), though initially it appeared to result in a loss of Rs 800. The order should be accepted.

## B) Discounting Concept

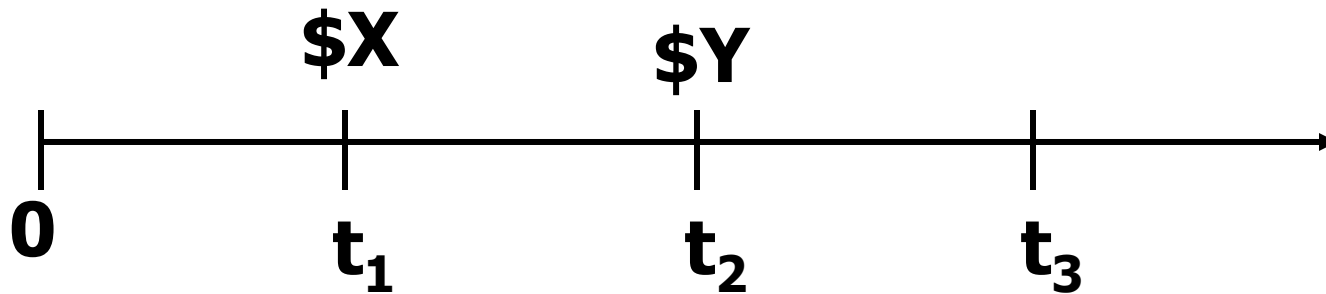
The process of determining the **present value of a payment or a stream of payments that is to be received in the future**. Given the **time value of money**, a dollar is worth more today than it would be worth tomorrow given its capacity to earn interest. Discounting is the method used to figure out how much these future payments are worth today.

It is most relevant in investment decisions

For Example, the present value of a receipt of Rs.110 after one year is Rs.100 at a discount or interest of 10%

# Typical 'Time Value of Money' Problems in Business

- How to compare or evaluate two different dollar amounts at two different time periods?



Assume  $x = \$900$ ,  $y = \$1000$ ,  $r = 6\%$ ,  $t_1 = 3$ ,  $t_2 = 5$

# Time Value of Money

## (Basic Concept)

- A dollar is worth more (or less) the sooner (later) it is received or paid due to the ability of money to earn interest.

$$\Rightarrow PV = (FV) / (1 + r)^n.$$

Or

$$\Rightarrow FV = PV * (1 + r)^n.$$

$$\begin{aligned} PV(X) &= 900 / (1 + 0.6)^3 \\ &= 900 / 1.191 \\ &= 755.66 \end{aligned}$$

$$\begin{aligned} PV(X) &= 1000 / (1 + 0.6)^5 \\ &= 1000 / 1.3382 \\ &= 747.38 \end{aligned}$$

# Time Value of Money

## (Applications/Uses)

1. To evaluate business decisions where at least some of the cash flows occur in the future
2. To project future dollar amounts such as cash flows, incomes, prices
3. To estimate equivalent current-period values based on projected future values

## **C .Opportunity Cost**

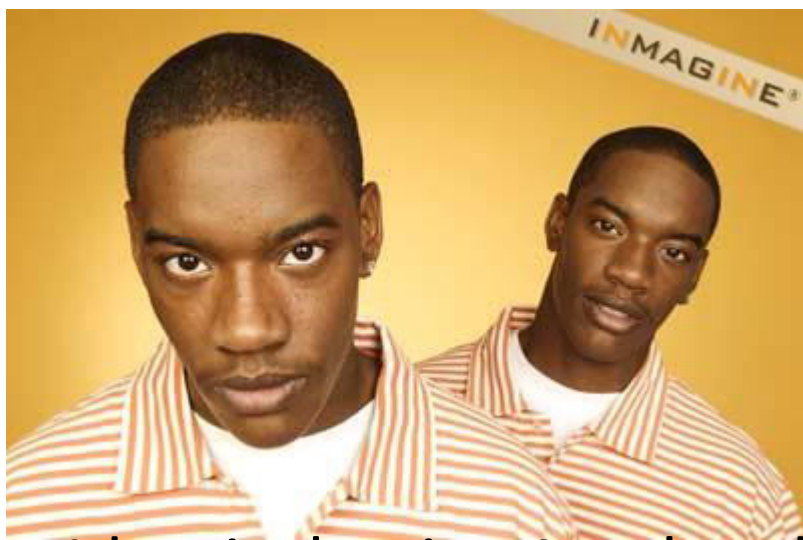
Resources are scarce and limited. When we put resources for a particular output, we forego some other output.

**The opportunity cost of any action is the best alternative forgone**

A student has limited time and hence he has to forego much entertainment , fun and leisure for devoting more time to studies to get a good rank.

Here his opportunity cost is the foregone fun time.

On the other hand, if he devote more time for fun, his opportunity cost is good rank.



- Identical twins Amal and Juan graduate with Bachelors degrees and receive the same job offer. Amal passes up the job offer to pursue a Masters degree while Juan takes the job offer and begins working.
- Two years pass and Amal graduates and begins working. By this time Juan has been promoted to a position that is comparable to Amal's starting position, and Juan's salary has increased to an amount that is comparable to Amal's starting salary.

# So who made the better decision, Amal or Juan?

- In business and in life, every choice we make comes at a cost since we forgo other possible alternatives in the process; this cost — whether it's money, time, education, health, etc. — is known as an opportunity cost. More specifically
  - In the example, one could argue that Amal made the better decision since a Masters degree would be valuable if both lost their jobs and found themselves in a competitive job market. Yet when you look at the situation in terms of opportunity costs, Amal's Masters degree came at a cost of two years salary. *If* Amal and Juan stay on equal career paths from here on out, Juan ends up making the better decision.

**An opportunity cost is the value or benefit of the next best alternative.**

## D) Time Concept (Long run & Short run)

- ▶ In analyzing cost, revenue and profit, economist usually make assumptions on time span like “short-run” and “long-run”.
- ▶ **Short run** is a period during which certain **costs are fixed and certain others are variable**. The capital cost such as plant & machinery are fixed in the short run where as raw materials and labour are variable.
- ▶ But **all costs are variable** in the **long run** as **new fixed capital can be added** as in the **case of capacity expansion**.

### Caselet 1:

koshys can add new batches by varying faculty and class rooms in the existing facility in the short run. But beyond a point, to add new student batches, KGI will have to increase its fixed capital i.e, new land, building, auditorium, hostels etc.

# E. Marginal Analysis

The **goal of economic choice** is to get the **greatest value from resources**. To accomplish this goal, you want to **evaluate the difference in the total benefits and total costs** of an activity. If **total benefits exceed total costs** for at least some levels of the activity, you want to **maximize the net benefits**.

If the **total costs exceed total benefits** for all levels of the activity, then you want to **minimize net losses**.

Net benefits are maximized or net losses are minimized when the decision maker follows a simple rule. **Continue engaging in an activity as long as the marginal benefit is greater than or equal to the marginal cost**.

Marginal analysis enables people to get the greatest value from resources when they make decisions. **Marginal benefit (MB) is the change in total benefits that occurs if an activity increases by one unit**.

# Equimarginal Principle

This principle relates to **optimum utilization of scarce resources**, when they are put to **different uses**.

According to this principle, an input should be allocated to various uses in such a way that **the value added by the last unit of the input is same for all the uses**.

If the marginal contribution of input for all the uses are not equal, **it is advisable to make a reallocation until the marginal contribution to output become equal for all the uses**.

This will ensure **optimum utilization** of scarce resources.

Utility is the satisfaction or benefit derived by consuming a product; thus the marginal utility of a good or service is the change in the utility from an increase in the consumption of that good or service.

This principle assumes the operation of the law of diminishing returns / utility.

## Caselet 1:

Priya is a rational consumer. She goes to a restaurant occasionally to take food. Her favorites are masala dosa and Vada each costing Rs.10 per plate. The utility (satisfaction) she gets from masala dosa, and vada are given below

Assuming that Priya budgets to spend only Rs.30 for her food, how will she order each item using equimarginal principle?

# The Equi-marginal Principle, or How to Spend Your Last Rupee

<b>The Equi-marginal Principle, or How to Spend Your Last Rupee</b>		
<b>Number</b>	<b>Marginal Utility of Masala dosa</b>	<b>Marginal Utility of vada</b>
<b>First</b>	<b>20</b>	<b>10</b>
<b>Second</b>	<b>10</b>	<b>8</b>
<b>Third</b>	<b>7</b>	<b>6</b>
<b>Fourth</b>	<b>3</b>	<b>5</b>
<b>Fifth</b>	<b>1</b>	<b>4</b>

- Suppose that the person is not at the optimal solution of two MD and one vada. Suppose instead that he has one MD and 2 Vada. **Can we tell from the table that he has spent his money incorrectly? We can.**

Let, masaladosa and vada cost the same. Suppose that each costs Rs.10 and the person has Rs.30. to spend. Then the last rupee spent on vada gave the person only 8 utils, whereas the last rupee spent on MD gave him 10 utils. The rupee spent on MD gave a much larger return, and if he could shift money from the area in which it is giving a low return to the area in which it has a high return, he will be better off. This is the basic idea of the **equimarginal principle**. Maximization occurs when the return on the last rupee spent is the same in all areas.

- In terms of a formula, a person wants  
**(Marginal Benefit of A)/(Price of A) = (Marginal Benefit of B)/(Price of B)**  
 here in our example.....

$$\text{MB of MD/price of MD} = \text{MB of Vada/price of Vada}$$

# Production Possibility Frontiers

- Show the different combinations of goods and services that can be produced with a given amount of resources
- No 'ideal' point on the curve
- Any point inside the curve – suggests resources are not being utilised efficiently
- Any point outside the curve – not attainable with the current level of resources
- Useful to demonstrate economic growth and opportunity cost

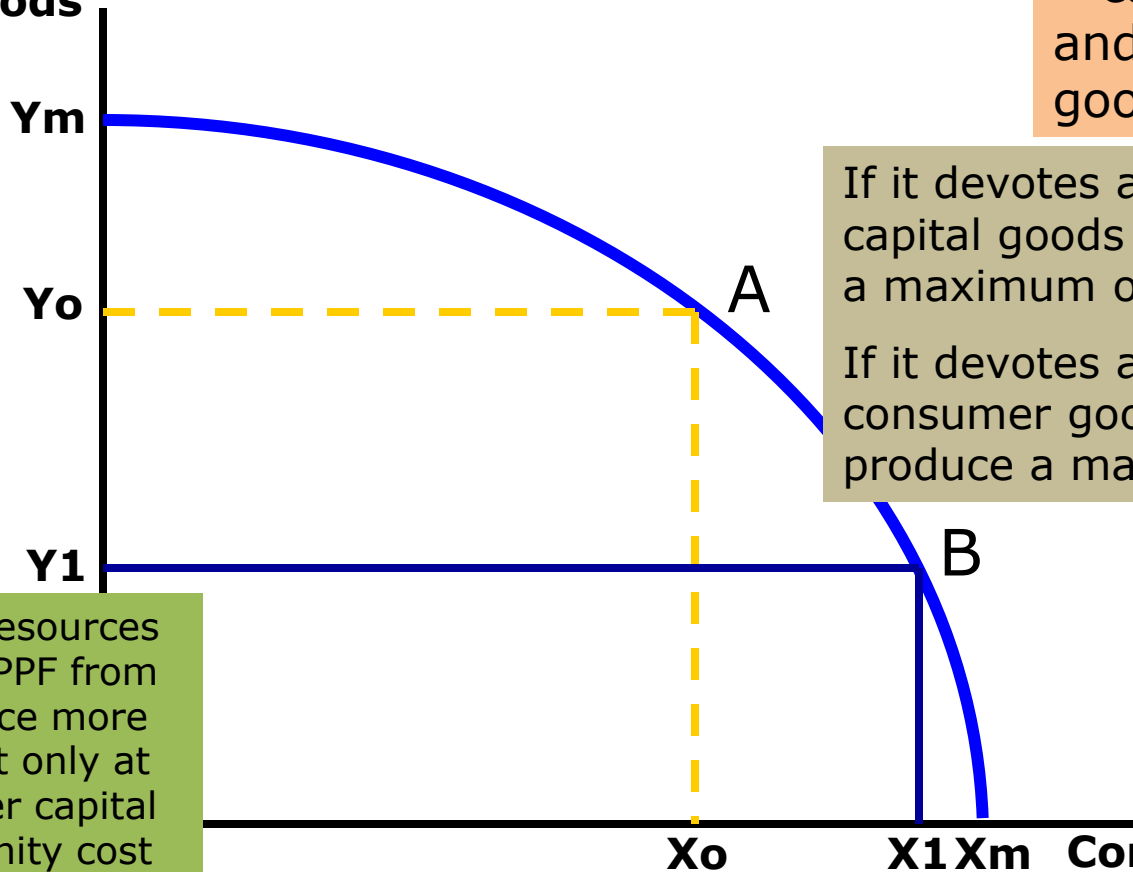
- Assume a country can produce two types of goods with its resources – capital goods and consumer goods
- If it devotes all resources to capital goods it could produce a maximum of  $Y_m$ .
- If it devotes all its resources to consumer goods it could produce a maximum of  $X_m$
- If the country is at point A on the PPF It can produce the combination of  $Y_0$  capital goods and  $X_0$  consumer goods
- If it reallocates its resources (moving round the PPF from A to B) it can produce more consumer goods but only at the expense of fewer capital goods. The opportunity cost of producing an extra  $X_0 - X_1$  consumer goods is  $Y_0 - Y_1$  capital goods.

# Production Possibility Frontiers

If the country is at point A on the PPF It can produce the combination of  $Y_0$  capital goods and  $X_0$  consumer goods

Assume a country can produce two types of goods with its resources – capital goods and consumer goods

**Capital Goods**

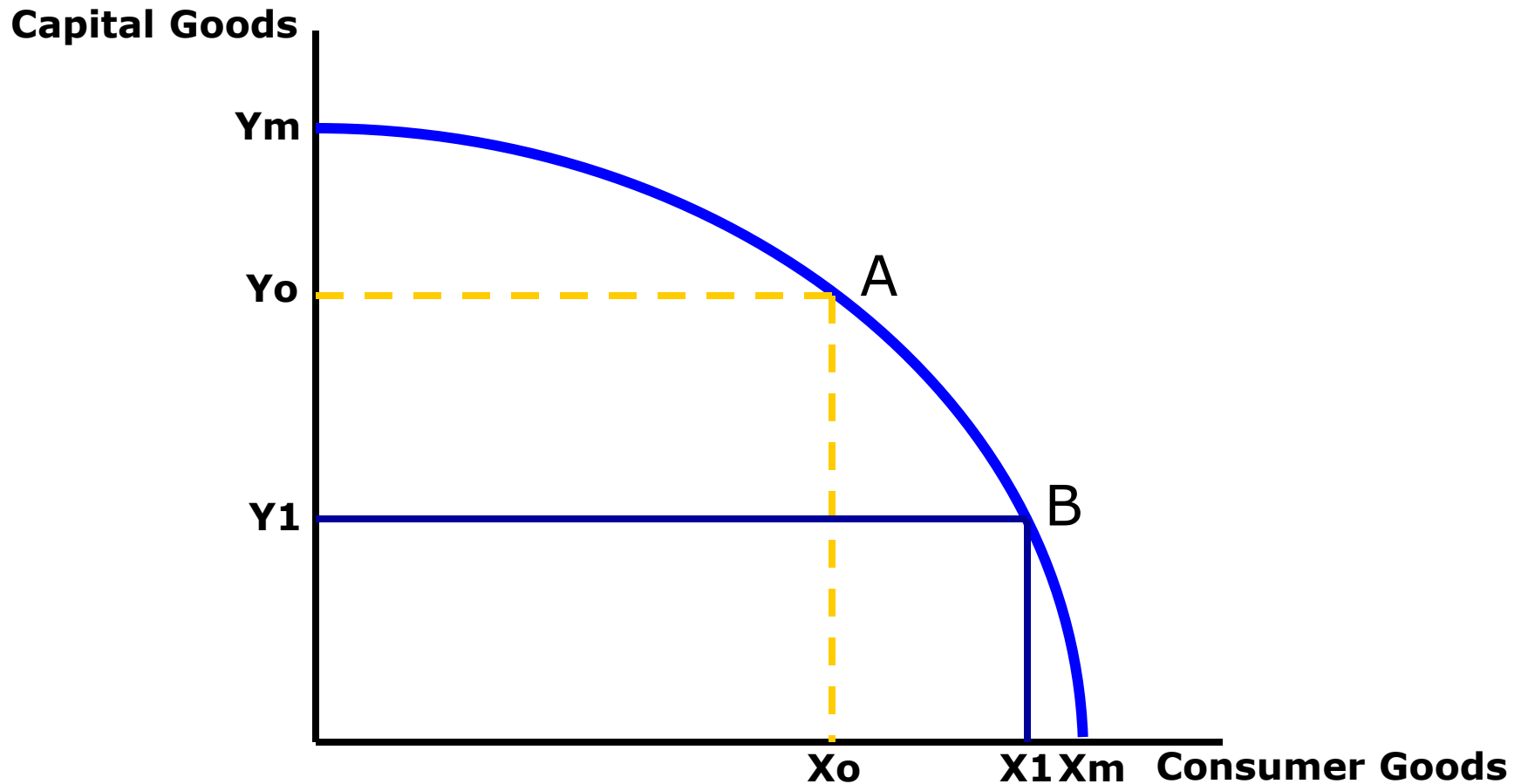


If it devotes all resources to capital goods it could produce a maximum of  $Y_m$ .  
If it devotes all its resources to consumer goods it could produce a maximum of  $X_m$

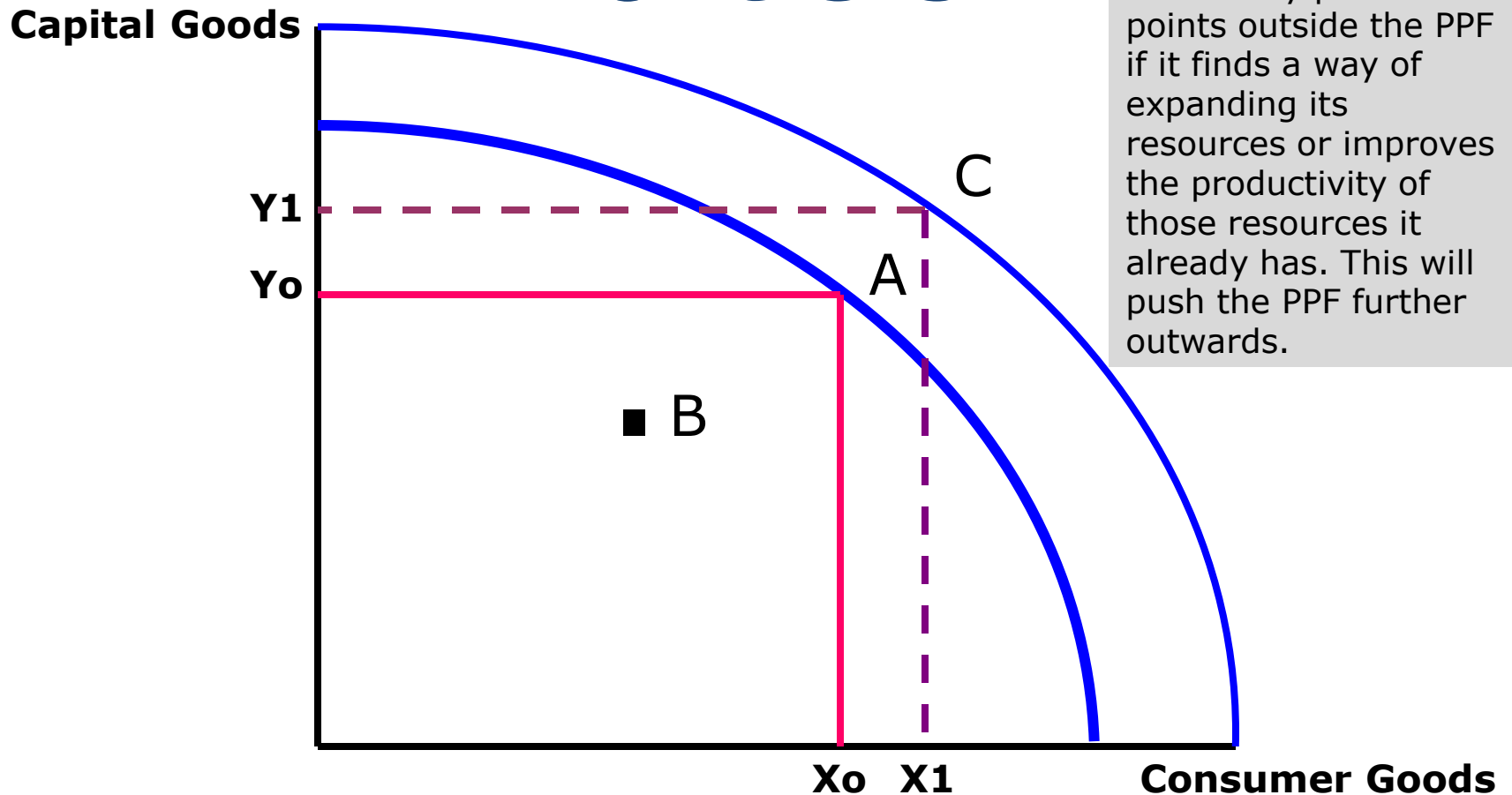
If it reallocates its resources (moving round the PPF from A to B) it can produce more consumer goods but only at the expense of fewer capital goods. The opportunity cost of producing an extra  $X_0 - X_1$  consumer goods is  $Y_0 - Y_1$  capital goods.

**Consumer Goods**

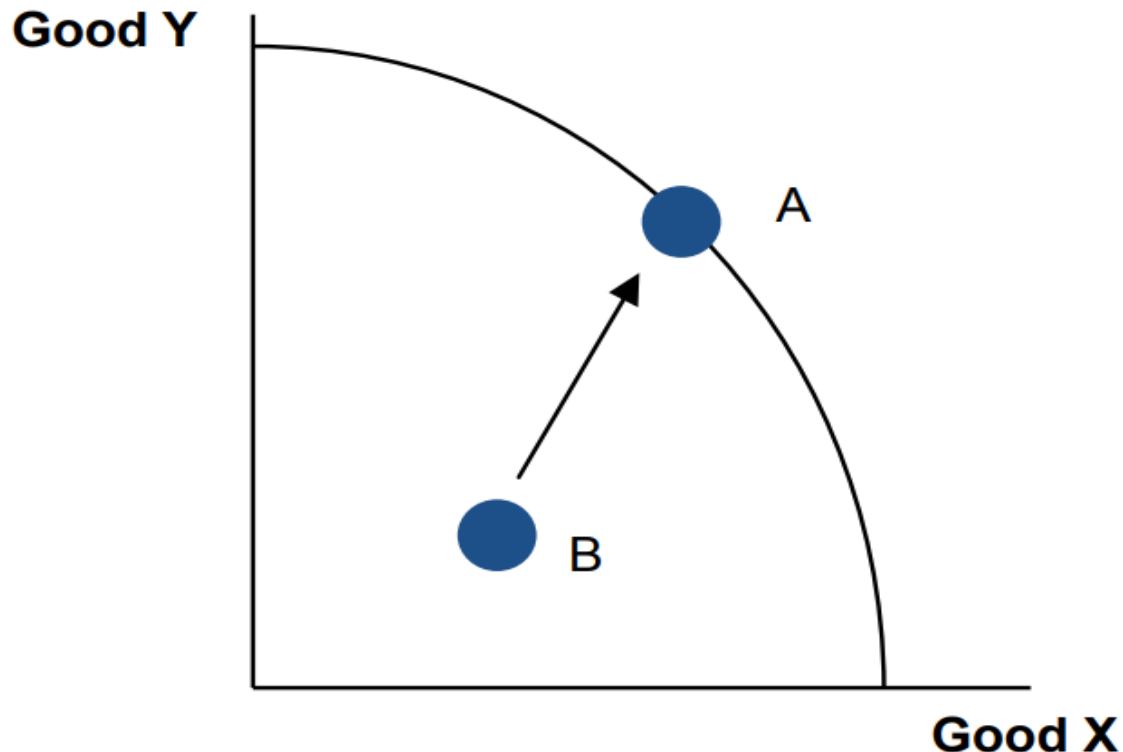
# Production Possibility Frontiers



# Production Possibility Frontiers



## Pareto inefficient-Wastage of Resources



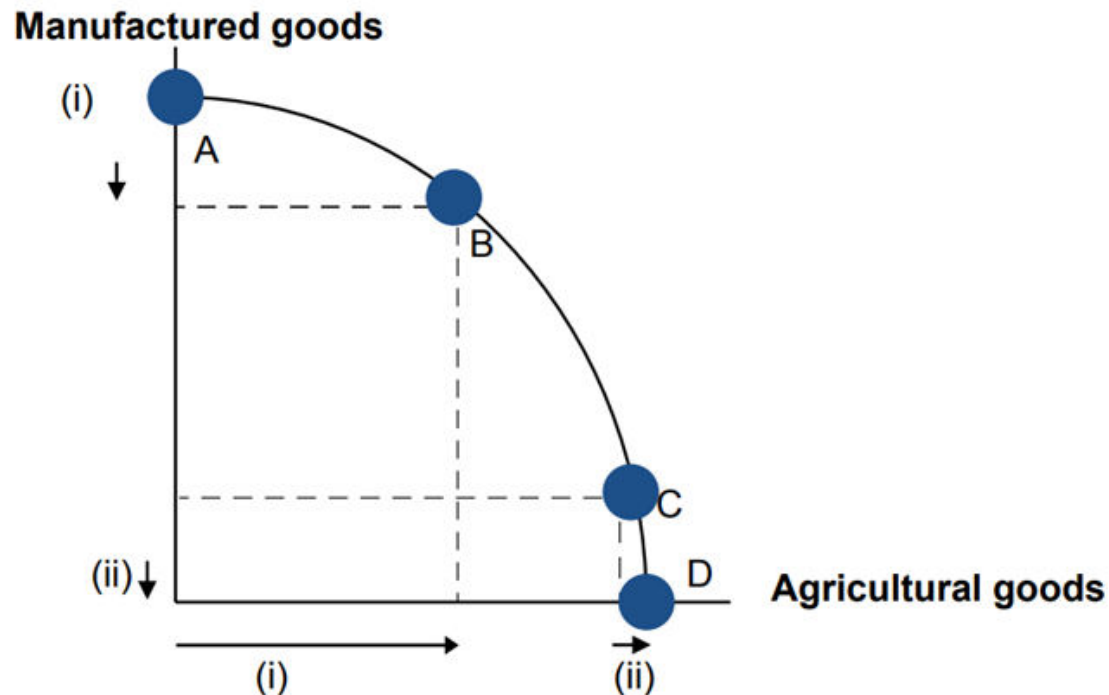
If there was **unemployment** in an economy, then it would be **possible to increase the output of a good without reducing the output of others**. This indicates that resources are being wasted and is termed “**Pareto inefficient**”. **Point A is Pareto efficient**. It is not possible to have more of good X without having less of good Y, and vice versa. This is not true at point B. Here it is clearly possible to increase the output of one of the goods without having less of another.

# Why are PPFs not usually straight lines?

- If a production possibility frontier was a **straight line**, it would **imply that any factor of production was equally good at operating in any industry** – i.e. a worker would be equally effective whether (s) he was in computing, mining or bus driving. This would mean that factors of production were perfectly substitutable.
- In reality, we know that this is not so. For example, some plots of land are better for growing things on than others. Imagine a case where an economy was producing only manufactured goods. All the land would be being used for factories.
- Suppose now that the country gave up 20% of its factories, and used the land freed up to grow things. Obviously the economy would choose to use the most fertile land to grow things on. Therefore, giving up a small amount of manufactured goods would lead to a huge increase in agricultural goods (movement from A to B on the diagram below) as the fertile land was used for agriculture.

# Why are PPFs not usually straight lines?

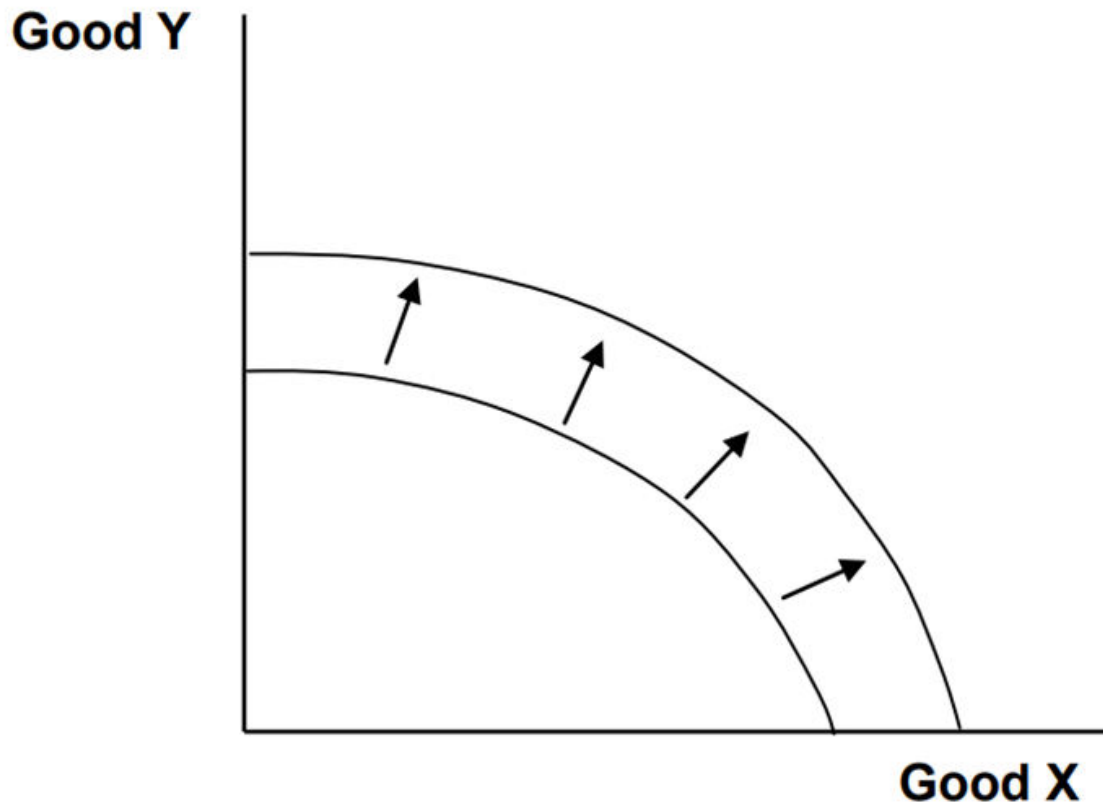
- However, if we continue to switch resources from manufactured goods to agriculture, we will have to use less and less suitable land. Hence each set of manufactured goods we give up will produce fewer and fewer extra agricultural goods, as we have to use poorer and poorer soil. For the last increment (from C to D), we give up manufactured goods, but get almost nothing in return because we are attempting to grow things on the beach, or on solid rock. Therefore, PPFs are non-linear (not straight lines) because resources are not perfectly substitutable.



# Shifts in PPFs:

## 1. An increase in total factors of production/factor productivity

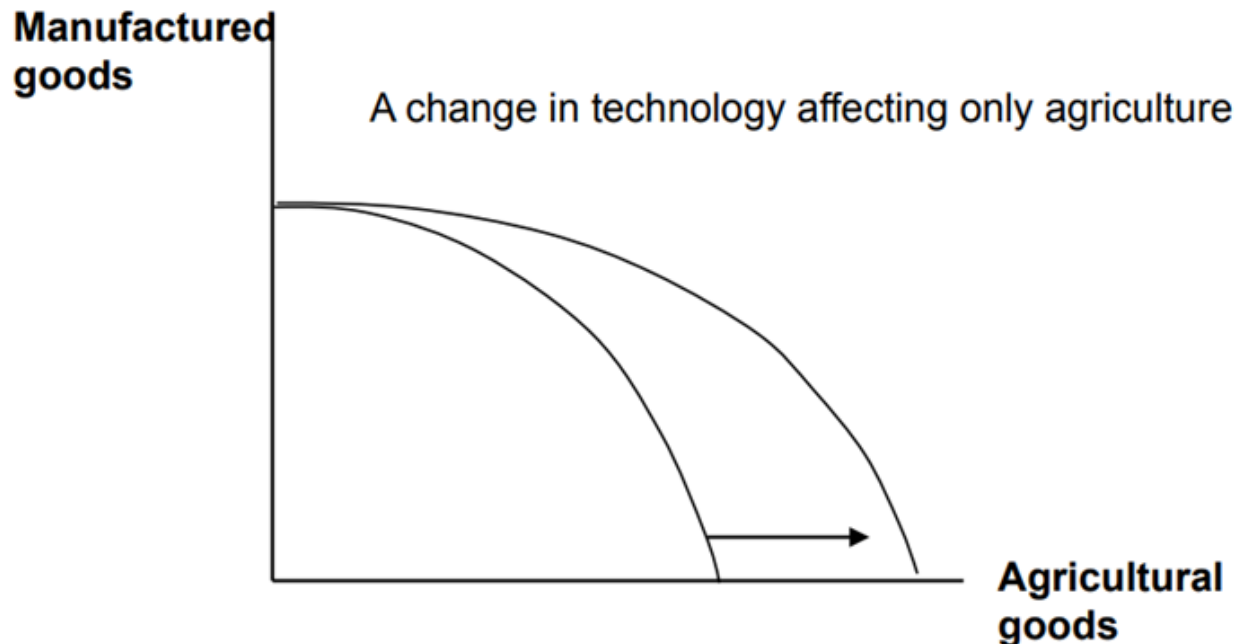
- This could occur because of an increase in population, investment by firms in new machines and so on. There are more factors of production, so the potential output is now higher.



# Shifts in PPFs:

## 2. A change in one industry

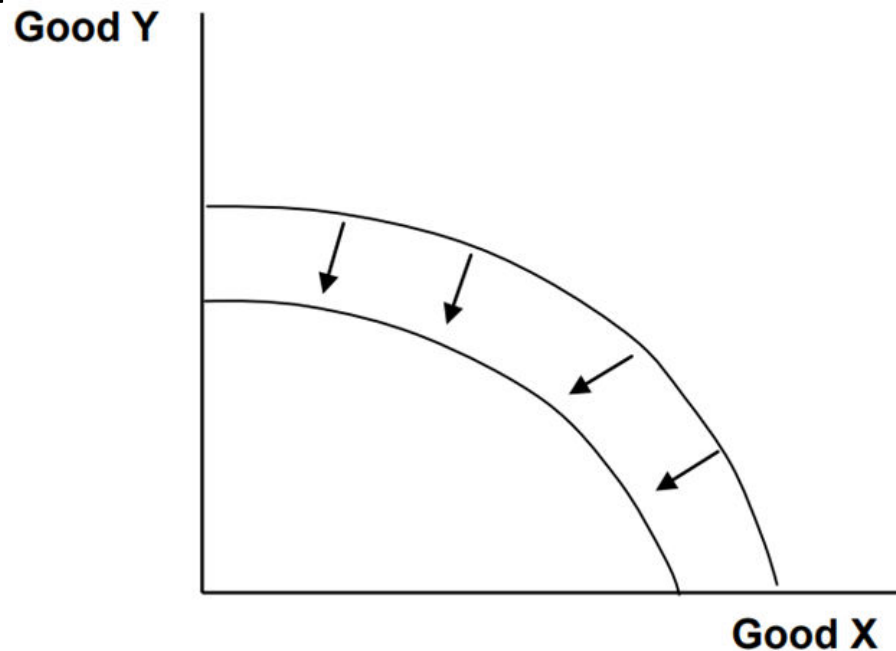
- Sometimes a change may come about that affects only one industry. For example the invention of computers affected manufacturing industry but (arguably) had little effect on agriculture. Likewise 'miracle rice' invented in the 1960s, dramatically increased the yield from land for agriculture, but had little effect on manufactured goods. Hence, an increase in technology or productivity affecting one industry will not lead to a parallel shift in the PPF:



# Shifts in PPFs:

## 3. Depletion of natural resources

Sometimes, the potential output of an economy could be reduced – a war for example, or running out of oil and gas. Under these circumstances, the maximum output of all goods will be reduced, shifting the PPF inwards.



Important note: Unemployment does not cause the PPF to shift inwards. This is because the workers are still available to be used, even though they do not currently have jobs. Thus the PPF shows the potential maximum output; its position is not affected by changes in demand and resource utilisation, at least not in the short run.

# Theory of the Firm

- **Definition** : A collection of resources that is transformed into products demanded by consumers.
- The firm buys and coordinates the services of production factors such as land, labour and capital along with its organization for producing a commodity and sells it in the market to the households.
- Firm controlled by entrepreneur who takes major decisions like:
  - What to produce?
  - Where to produce?
  - How and how much to produce?
  - Whom to sell and at what price?

# Theory of the Firm

- The theory of the firm is a microeconomic concept that states that a **firm exists and make decisions to maximize profits.**
- A firm **maximizes profits** by creating a gap between **revenue and costs.**
- While early economic analysis focused on broad industries, as the 19th century progressed, more economists began to ask basic questions about **why companies produce what they produce and what motivates their choices when allocating capital and labor.**
- However, the theory has been debated and expanded to consider whether a company's goal is to **maximize profits in the short-term or long-term.**
- Modern economist who takes on the theory of the firm sometimes distinguish between **long-run motivations**, such as sustainability, and **short-run motivations**, such as profit maximization.
- If a company's goal is to **maximize short-term profits**, it might find ways to **boost revenue and reduce costs.**
- However, companies that **utilize fixed assets**, like equipment, would ultimately **need to make capital investments** to ensure the company is **profitable in the long-term.** The use of cash to invest in assets would **undoubtedly hurt short-term profits** but would help with the **long-term viability of the company.**

# Theory of the Firm

- **Competition** (not just profit) can also impact the decision making of company executives.
- If **competition is strong**, the company will need **to not only maximize profits** but also **stay one step ahead** of its competitors **by reinventing itself and adapting its offerings**. Therefore, **long-term profits** could only be **maximized** if there's a **balance between short-term profits and investing in the future**.
- The major economic theories that are involved in the examination of the nature of the firm are as follows:

# Theory of the Firm

## 1. Transaction cost theory

In economics and related disciplines, a **transaction cost** is a cost in making any economic trade when participating in a market. Oliver E. Williamson defines **transaction costs** as the **costs of running an economic system of companies**, and unlike production costs, decision-makers determine strategies of companies by measuring transaction costs and production costs. Transaction costs are the total costs of making a transaction, including the **cost of planning, deciding, changing plans, resolving disputes, and after-sales**.

- It is related to the problems of **co-ordination and motivation**.
- Costs will occur whichever method of transaction is used, spot markets, long term contracts or internalization within the firm, but they will vary according to the method.

### a. Co-ordination costs

- These costs are sometimes referred to as **Coasian costs**, since Coase was the first economist to examine them in detail.
- The following categories of costs can be determined here:
  1. **Search costs.** Both **buyers and sellers** have to **search for the relevant information before completing transactions**. Such information relates to prices, quality, delivery and transportation; in markets this search is **external**, while **within organizations(internal)**, information held in different parts of the organization must be transmitted through the relevant channels to the decision-makers.

# Theory of the Firm

## 1. Transaction cost theory

This examines the costs of undertaking transactions in different ways. Different methods are appropriate under different circumstances.

- Even in highly efficient markets like stock exchanges **a large amount of resources**, in terms of physical assets like buildings and computers and human assets in the form of brokers, is **devoted to providing the relevant information**.

**2. Bargaining costs.** These are more relevant when markets are involved, where **negotiations for major transactions** can be protracted, but even within the firm, salary and wage negotiations can also be costly in terms of the time and effort of the parties involved.

**3. Contracting costs.** There are costs associated with **drawing up contracts**; these take managerial time and can involve considerable legal expense.

## b. Motivation costs

- These costs are often referred to as **agency costs**.
- An **agency cost** is a type of **internal company expense**, which comes from the **actions of an agent (management) acting on behalf of a principal (Shareholders)**.
- Agency costs typically arise in the wake of **core inefficiencies, dissatisfactions, and disruptions, such as conflicts of interest between shareholders and management**.
- In this stage we can observe that there are two main categories of such costs.

# Theory of the Firm

## 1. Transaction cost theory:

**1. Hidden information.** This relates to **asymmetries referred** to earlier. **One or several parties** to a transaction may **have more information** relevant to the transaction **than others**. This means that certain information is hidden to one party which gives advantage to another.

A classic example of this is the second hand car market, where sellers have a big advantage over buyers. This has many consequences for the market, which are discussed later, but one obvious effect is that buyers may have to devote resources to obtaining more information (for example, paying for an engineer's inspection of a car).

**2. Hidden action.** Even when **contracts are completed** the parties involved often have to **monitor the behavior of other parties to ensure** that the terms of the contract are being upheld.

- **Monitoring and supervision are costly**, and there is a further problem because this behaviour is often difficult to observe directly. This problem is known as **'moral hazard'**. The situation is even more costly if legal action has to be taken to enforce the terms of the contract.

Transactions have a number of attributes which affect the above costs and therefore affect the way in which they are conducted, in particular **asset specificity, frequency, complexity and relationship with other transactions**.

# Theory of the Firm

## 1. Transaction cost theory

- **Asset specificity** refers to **how easy it is for parties in a transaction to switch partners without incurring sunk costs**, meaning costs that cannot be recovered. For example, a firm that commits itself to building a facility designed for a specific customer will usually want to be protected by a long-term contract.
- Again, transactions that are repeated **frequently** may most easily be conducted by having a **long-term contract instead** of negotiating individual spot transactions, as with obtaining cleaning and catering services.

One of the **main implications of transaction cost theory** is that there is an **optimal size of the firm from the point of view of minimizing transaction costs**.

- Generally, as the **firm increases in size and incorporates more transactions** internally as opposed to transacting in the market, those **costs associated with using the market decrease**, while those **costs associated with co-ordination increase as the amount of administration and bureaucracy increases**. There is thus a **trade-off situation**, with the **optimal size of the firm** being at the point where 'the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing another firm'.

# Theory of the Firm

## 2. Motivation theory

- This examines the underlying factors that cause people to behave in certain ways.
- In order to understand the nature of the firm we must first appreciate that any firm consists of individuals.
- In order to **understand the behavior** of these individuals we must in turn **examine the nature of motivation**.
- Economists tend to **assume that people in general act** in such a way as to **maximize their individual utilities, where these utilities are subjective measures of value or satisfaction**.
- Thus the fundamental pillar in the **basic economic model of behavior** is that people are **motivated by self-interest**.
- The **resulting behavior** is sometimes said to typify **homo economicus**.
- However, it is **not just economists** who make use of this basic assumption. It has been applied in the **fields of politics** also.

The main criticisms are that the economic model is too narrow and ignores altruistic behaviour and spiteful behaviour.

# Theory of the Firm

## 2. Motivation theory

### a. Altruistic behavior

**Altruism** is the principle and moral practice of concern for happiness of other human beings or other animals, resulting in a quality of life both material and spiritual.

- Unfortunately some confusion is caused by the fact that various economists, psychologists and biologists have used the term altruism in different ways.
- Some **economists**, such as Hirshleifer and Collard, insist that **altruism** refers to **motivation rather than action**.
- However, **biologists** tend to view **altruistic motivation** as biologically impossible, meaning that it could not have evolved and survived. They therefore tend to mean by altruistic behavior, any behaviour which confers a benefit to others, while involving a cost to the originator of the behaviour, with no corresponding material benefit (in monetary or genetic terms). Some biologists do include genetic or material benefits in their definition of altruism when they refer to kin selection and reciprocal altruism.

# Theory of the Firm

## 2. Motivation theory

### b. Spiteful behaviour

- This can be viewed as the flip side of altruistic behaviour. This is the behaviour which **imposes a cost on others, while also involving a cost to the originator of the behaviour, with no corresponding material benefit.** An example is vandalism, which damages the property of others, while incurring the possibility of being caught and punished.
- In the business context it is possible that some industrial strikes and stoppages also feature spiteful behaviour, if labour unions are prepared to forgo income in order to damage the welfare of the management.

# Theory of the Firm

## 3. Property rights theory

- This is a relatively new area of economic theory, opened up in the 1980s, with a seminal paper by Grossman and Hart in 1986.
- The focus is on **the issue of ownership; the nature of ownership and its relationship with incentives to invest and bargaining power** are the key features of this model.
- The institution of **private ownership and the associated property rights** is one of the most fundamental characteristics of any capitalist system.
- Its main advantage compared with the state ownership of the majority of assets found in communist countries is **that it provides strong incentives to create, maintain and improve assets.**
- However, we must ask the question:  
**what does it mean to own an asset?**

This question turns out to be particularly difficult to answer for a complex asset like a firm.

There are two main issues involved in dealing with this question:

- i. residual control and
  - ii. residual returns.
- These are discussed first, before turning to **the issues of efficiency and the allocation of property rights.**

# Theory of the Firm

## a. Residual control

- Even for simple assets the **concept of ownership** is more complex than it might seem at first sight.
- Take a hi-fi system; you are free to use it when you want, but the noise level you are permitted to play it at is often limited by law, according to time of day. You may not be allowed to use it in certain locations. You may not be permitted to play certain material on it, particularly if it involves public broadcast as opposed to private use. Usually there are no limits on lending it out or selling the asset. However, we can now see that the owner has residual rights of control, in the sense that the owner's decisions regarding the asset's use are circumscribed by law and by any other contract involving the rights of other parties to use of the asset. Therefore **property rights are limited** in practice, even in a capitalist system.
- As we have seen in the previous section, contracts in practice tend to be incomplete. Therefore the residual rights of control are by necessity unspecified, but relate to all those that are not explicitly regulated by law or assigned to other parties by contract. This makes the process of contracting much easier, but it can lead to ambiguities for complex assets like firms, as is seen shortly.

# Theory of the Firm

## b. Residual returns

- It is a **fundamental feature of ownership** of an asset that the **owner is entitled to receive income** from it.
- With some assets like cars or buildings this could be a rental income, but there would be some expenses involved, like maintenance and repair, and the liability to pay these would have to be specified in the contract.
- Likewise, there may be a legal obligation to pay taxes on the income.
- Thus, again, the returns received by the owner can be viewed as **residual**.
- We will consider the situation relating to the residual returns for firms once the issue of the allocation of property rights has been considered.
- The central idea of the **property rights** view is that **bargaining power** – and **the assets that confer bargaining power** – should be in the hands of those people whose efforts are most significant in increasing the value of the business relationship.

# Theory of the Firm

- **Giving these people more bargaining power** ensures that **they receive more of the rewards from investing** time and energy and, thus, that they have a stronger incentive to make these investments.
- This is a slightly oversimplified view, but it illustrates the main principles involved. Decisions about asset ownership – and hence firm boundaries – are important because control over assets gives the owner bargaining power when unforeseen or uncovered contingencies force parties to negotiate how their relationship should be continued.
- In the model often called the classical firm, **the ‘boss’ both has residual control and receives residual returns.**
- Assuming property rights are tradable the market for corporate control ensures that those people who are bosses are those best suited to the position.
- Furthermore, since control and returns are both vested in the same person, the boss has maximum incentive to manage the firm in a profitable manner, just as the owner of a simple asset like a car has an incentive to use the car efficiently, compared to a renter, who has no such incentive.
- In reality there are a number of problems with this oversimplified view.

# Theory of the Firm

- In public companies there are essentially four parties who can lay claim to certain rights of ownership and control: shareholders, directors, managers and other employees.

## 1. Shareholders.

- In legal terms **shareholders own the company**, but in practice their **rights are quite limited**.
- They **have voting rights** on issues such as changing the corporate charter, electing and replacing directors, and, usually, mergers.
- However, they have **no say in other major strategic issues**, such as hiring managers, determining pay levels, setting prices or budgets, or even determining their own dividends.
- Thus the rights of shareholders cannot be viewed as being residual; they are specified by law.

## 2. Directors.

- The board of **directors** certainly appears to **have residual control**, making many of the major strategic decisions of the firm, including hiring the managers and setting their pay levels.
- However, the **directors do not have a claim to the residual returns**; these essentially belong to the shareholders.

# Theory of the Firm

## 3. Managers.

- In practice the **senior managers** may have **effective control over** many of the major strategic decisions of the firm.
- This is **because they control the flow of information** within the firm and set the agenda for many board decisions; because shareholders rely on information from managers in electing the board, the managers may effectively determine board nominations.
- Thus there is a problem of asymmetric information in terms of managers having more information regarding the firm's operations than either board members or shareholders.
- There is also a problem of moral hazard in that it is difficult for either directors or shareholders effectively to monitor the activities of managers.

## 4. Other employees.

- This relates to **non-managerial workers**; again **managers rely on such workers to provide them with information**, and also to carry out managerial decisions.
- Thus, although like managers they have no residual claims on the firm, they do exercise some control.
- Once more the problems of **hidden information and hidden action** are present; in this case the other employees have more information than managers, and the managers are not able to observe their behaviour easily.

# Theory of the Firm

- Thus the concept of ownership of the firm, particularly in the case of the public company, is fraught with difficulties.
- In practice there are **subtle differences** in the **nature of ownership between different firms**, according to factors like the diversification of shareholders and the nature of the production process, and these tend to lead to different organizational forms.
- The **situation is made even more complex** by the fact that the returns to the various parties above are not simply in terms of current financial compensation.
- Managers can profit from obtaining experience, and from increased prestige, which often comes in the form of perquisites like company cars and expense accounts. Such returns are often in direct conflict with the residual returns to shareholders.
- Employees also benefit from training and experience as well as in terms of wages and salaries.
- They also benefit from taking leisure while working ('shirking'), which again is in direct conflict with the interests of shareholders, and also the interests of managers, if the latter can be held responsible for the resulting lack of productivity.

# Theory of the Firm

## 4. Behavioural theory of firm

- Behavioural theories of the firm consider **alternatives to profit maximization as a business objective.**
- Behavioural economists believe that large businesses are complex organizations made up of many different stakeholders.
- Stakeholders are groups made up of people who each have a vested interest in the activity of a business.

Examples include:

- i. Managers employed by a business and other employees.
- ii. Shareholders are people who have a stake in a business.
- iii. Customers.
- iv. The government and its agencies.

Each group of stakeholders will have different objectives or goals. The dominant group at any moment can focus on their own objectives.

Behavioural Theories of the Firm include:

# Theory of the Firm

## 4. Behavioural theory of firm

### Size of a firm/prestige:

- Some managers may simply aim for working in a big and seemingly successful firm which gives more prestige and honour.
- Managers may be motivated to prove their projects are successful.
- This can cause firms to pursue goals which have a high profile.
- It may explain why firms persist with projects which may not be desirable.
- There is a cost to letting go of past decisions.

### Profit satisficing:

- Based on the problem of asymmetric information.
- Owners wish to maximise profits, but, workers don't.
- Because owners don't have perfect information, workers and managers are able to get away with decisions that don't maximise profits.

# Theory of the Firm

## 4. Behavioural theory of firm

### Co-operative/ethical concerns:

- Some firms may be set up with very different objectives to the traditional model of profit maximisation.
- In co-operative firms, the goal is to maximise the welfare of all stakeholders. In this model, ideas of altruism, concern for the environment and workers welfare may explain many decisions.
- The firm may also be set up with specific charitable aims.

### Human emotion/bias:

- The economic model of a rational economic man assumes that individuals seek to maximise their economic welfare with rational choice. However, in the real world, we are influenced by human emotion.
- This could be discrimination based on bias and prejudice. Or it could be irrational exuberance and the perceived wisdom of following the crowd.
- For example, in asset bubbles, mortgage companies can get caught up in relaxing their lending criteria and lending mortgages to those at risk of default.

# Theory of the Firm

## 5. Managerial Theory of Firm:

- Managerial theories of the firm place emphasis on various incentive mechanisms in explaining the behavior of managers and the implications of this conduct for their companies and the wider economy.
- According to traditional theories, the firm is controlled by its owners and thus wishes to maximise short run profits.
- The more contemporary managerial theories of the firm examine the possibility that the firm is controlled not by its owners, but by its managers, and therefore does not aim to maximise profits.
- Although profit plays an important role in these theories as well, it is no longer seen as the sole or dominating goal of the firm.
- The other possible aims might be sales revenue maximization or growth.

# Theory of the Firm

## Baumol's Theory of Sales Revenue Maximisation:

Prof. Baumol, in his book 'Business behaviour, Value and Growth' has propounded a theory of Sales Maximisation.

- According to this theory, **once profits reach acceptable levels**, the goal of the firms **become maximisation of sales revenue rather than maximisation of profits**.
- The above definition maintains that when the profits of firms reach a level considered satisfactory by the shareholders then the efforts of the managers are directed to maximise revenue by promoting sales instead of maximising profit.
- While studying this theory. It must be kept in view that firms do not ignore profit altogether. They do aspire to attain a general level of profit. But once an acceptable level of profit is obtained their goal shifts to sales maximisation in place of profit maximisation.
- He stressed that in competitive markets, firms would rather **aim at maximising revenue, through maximisation of sales**.
- According to him, sales volumes, and not profit volumes, determine market leadership in competition.
- He further stressed that in large organisations, management is separate from owners. Hence there would always be a dichotomy of managers' goals and owners' goals. **Manager's salary and other benefits are largely** linked with sales volumes, rather than profits.

# Theory of the Firm

## Baumol's Theory of Sales Revenue Maximisation:

- Baumol hypothesised that **managers often attach their personal prestige** to the company's revenue or sales; therefore they would rather attempt to maximise the firm's total revenue, instead of profits.
- Moreover, **sales volumes are better indicator of firm's position** in the market, and growing sales strengthen the competitive spirit of the firm.
- Since operations of the firm are in the hands of managers, and managers' performance is measured in terms of achieving sales targets, therefore it follows that management is more interested in maximising sales, with a constraint of minimum profit.
- Hence the objective is not to maximise profit, but to maximise sales revenue, along with which, firms need to maintain a minimum level of profit to keep shareholder satisfied. This minimum level of profit is regarded as the profit constraint.

However, empirical evidence to support above arguments of Baumol is not sufficient to draw any definite conclusion. Whatever research has been done is based on inadequate data; hence the results are inconclusive.

Arguments in favour of Maximisation of Sales Goal

Following arguments are given in favour of maximisation of sales goal:

# Theory of the Firm

## Baumol's Theory of Sales Revenue Maximisation:

### i. More Realistic:

- Goal of maximisation of sales is a more realistic goal- In fact, firms accord more importance to the goal of sales maximisation than profit maximisation.
- It is so because success of a firm is generally judged from its total sales.

### ii. More Practical:

- Revenue maximisation thesis of Baumol is more practical. It is so because goal of revenue (Sales) maximisation leads to more production which, in turn, leads to fall in price. As a result, consumers' welfare is promoted.

### iii. More Availability of Loans:

- At the time of sanctioning loan to a firm, financial institutions mainly consider its sales. Prospects of loans are bright for such firms as have large total sales.

# Theory of the Firm

## **Baumol's Theory of Sales Revenue Maximisation:**

### **iv. Strong Position in the Market:**

- Maximum sales of a firm symbolize its strong position in the market.
- Sales of a firm will be large only in that situation when consumers like its production, firm has more competitive power and has been expanding. All these features are indicative of the progress of the firm.

### **v. More Advantageous to the Managers:**

- It is more to the advantage of the managers that the firm should aim at sales maximization. This way their credibility enhances in the market.
- Maximum sales is a reflection of the competence of the managers It has a favorable effect on their wages.
- Firm is in a position to offer higher wages to the employees. Consequently, employer-employee relations become more cordial.
- It is the constant endeavor of the managers to maximize the sales of the firm after attaining a given level of profit.

# Theory of the Firm

## Marris Growth Maximization Model

- Marris proposed that **owners** (shareholders) aim at **profits and market share**, whereas **managers** aim at **better salary, job security and growth**.
- These two sets of goals can be achieved by **maximizing balanced growth** of the firm (G), which is **dependent on the growth rate of demand for the firm's products (GD) and growth rate of capital supply to the firm (GC)**.
- Hence growth rate of the firm is balanced when the demand for its product and the capital supply to the firm grow at the same rate.

Marris further said that firms face two constraints in the objective of **maximization of balanced growth**, which are explained below:

### i. Managerial Constraint

- Among **managerial constraints**, Marris stressed on the **importance of the role of human resource** in achieving organizational objectives. According to him, **skills, expertise, efficiency and sincerity** of team managers are vital to the growth of the firm.
- **Non availability of managerial skill** sets in required size creates constraints for growth: organizations on their high levels of growth may **face constraint of skill ceiling among the existing employees**.
- New recruitments may be used to increase the size of the managerial pool with desired skills; however new recruits lack experience to make quick decisions, which may pose as another constraint.

# Theory of the Firm

## Marris Growth Maximization Model

### ii. Financial Constraint

- This relates to the **prudence needed in managing** financial resources.
- Marris suggested that a **prudent financial policy** will be based on **at least three financial ratios**, which in turn set the limit for the growth of the firm.
- In order to prove their discretion, managers will normally create a tradeoff and prefer a
  - i. moderate debt equity ratio ( $r_1$ ),
  - ii. moderate liquidity ratio ( $r_2$ ) and
  - iii. moderate retained profit ratio ( $r_3$ ).

A brief description is given hereunder:

#### (a) Debt equity ratio ( $r_1$ ):

- This is the ratio between borrowed capital and owners\* capital.
- **High value** of debt equity ratio **may cause insolvency**;
- hence a low value of this ratio is usually preferred by managers to avoid insolvency.
- However, **a low value of  $r_1$** , may create a **constraint to the growth of the firm** in terms of dependence on high cost capital, i.e., equity.

# Theory of the Firm

## Marris Growth Maximization Model

### (b) Liquidity ratio ( $r_2$ ):

- This is the ratio between current assets and current liabilities and is an indicator of coverage provided by current assets to current liabilities.
- According to Marris, **a manager would try to operate** in a region where there is **sufficient liquidity and safety** and hence would prefer a **high liquidity ratio**.
- But a **high  $r_2$**  would imply **low yielding assets**, since **liquid assets** either **do not earn at all (like cash and inventory)**, or **earn low returns** (like short term securities).

### (c) Retention ratio ( $r_3$ ):

- This is the ratio between retained profits and total profits.
- In other words, it is the **inverse of dividend payout ratio**, i.e., the retained profits are that portion of net profit which is not distributed among shareholders.
- A **high** retention ratio is **good for growth**, as retained profits provide internal source of funds.
- However, a **higher  $r_3$**  would imply **greater volume of retained profits**, which may antagonise the shareholders.
- Hence managers cannot afford to keep a very high value of retention ratio.

# Theory of the Firm

## **Williamson's Managerial Discretionary Theory:**

- The theory of Managerial Utility Maximisation was developed separately by Berle-Means-Galbraith and Williamson. It is also known as Managerial Discretion Theory.
- The Theory is based on the concept that shareholders or owners of the firm and managers are two separate groups.
- The owners or the shareholders want high dividends and are therefore, interested In maximising profits, the managers,
- on the other hand, have different motives other than profit maximisation.
- Once the managers have achieved a level of profit that will pay satisfactory dividends to shareholders and still ensure growth.

# Theory of the Firm

- They are free to increase their own emoluments and also the size of their staff and expenditure on them.
- In the words of Williamson, “to the extent that the pressure from the capital market and competition in the product market is imperfect, the manager, therefore, has discretion to pursue goals other than profits.”
- Further Berle and Means suggested that "The lack of corporate democracy leaves owners or shareholders with little or no power to change corporation policy."

According to Williamson, "Managerial Utility function may be expressed as follows:

$$U = f (S, M, ID)$$

- It will be read as : Managerial utility is a function (f) of additional expenditure on staff, managerial emoluments and discretionary investment.
- (Here, U = managerial utility; S = additional expenditure on staff; M = managerial emoluments and ID = discretionary investment).
- Managerial utility function maximizes the utility of the managers rather than profits of the firm. The manager is expected to follow policies which maximize the following components of his utility function.

# Theory of the Firm

## **i. Expansion of Staff:**

- The manager will like to increase the quality and number of staff reporting to him.
- This will lead to an increase in the salary of the staff.
- More staff are valued because they lead to the manager getting more salary, more prestige and more security.

## **ii. Increase in Managerial Emoluments:**

- Managerial Utility also depends on managerial emoluments.
- It includes facilities like entertainment allowance, luxurious office, staff car, company phone, etc.
- Expenditure of this nature reflects to a large extent the prestige, power and status of the manager.

## **iii. Discretionary Power of Investment:**

- Managerial utility also depends on the discretion of the manager to undertake investment beyond those required for normal operations.
- The manager is in a position to invest in advanced technology and modern plants. Such investments may or may not be economically efficient. These investments may be undertaken for the self-satisfaction of the manager.

# Decision Process & Decision Steps

# What is decision-making?

The word decision is defined as:

*"A choice between two or more alternatives".*

Thus decision-making can be defined as:

*"the selection of a course of action from among alternatives".*

# Decision-making Process

## SIX STEPS TO DECISION MAKING

Each decision a manager takes can be framed and analyzed using a common approach based on six steps. They are as follows:

1. Define the Problem

2. Determine the Objective

3. Explore the Alternatives

4. Predict the Consequences

5. Make a Choice

6. Perform Sensitivity Analysis

# Decision-making Process

## **Step 1: Define the Problem**

You realize that you need to make a decision. Try to clearly define the nature of the decision you must make. The first step in making the right decision is recognizing the problem or opportunity and deciding to address it. To make a decision, you must first identify the problem you need to solve or the question you need to answer. Clearly define your decision.

## **Step 2: Determine the Objective**

If you need to achieve a specific goal from your decision, make it measurable and timely so you know for certain that you met the goal at the end of the process. To make this step efficient gather the information relevant to that choice. Do an internal assessment, seeing where your organization has succeeded and failed in areas related to your decision. Also, seek information from external sources, including studies, market research, and, in some cases, evaluation from paid consultants.

# Decision-making Process

## **Step 3: Explore the Alternatives**

Once you have a clear understanding of the issue, identify possible solutions to your problem. There is usually more than one option to consider when trying to meet a goal. In this step, you will list all possible and desirable alternatives.

## **Step 4: Predict the Consequences**

In this step, you'll need to “evaluate for feasibility, acceptability and desirability” to know which alternative is best. The choice you make will have consequences. Understanding the consequences of alternatives is must. This will help us weighing the suitability of alternatives.

# Decision-making Process

## **Step 5: Make a Choice**

Once you have weighed all the alternatives based on their consequences, you are ready to select the alternative that seems to be best one for you. You may even choose a combination of alternatives. When it's time to make your decision, be sure that you understand the risks involved with your choice. You're now ready to take some action by beginning to implement the alternative you chose.

## **Step 6: Perform Sensitivity Analysis/Review the outcome of your decision**

Important step in the decision making process is evaluating your decision for effectiveness. In this step, consider the results of your decision and evaluate whether or not it has given the expected outcome. If the decision has not met the expectation, you may want to repeat certain steps of the process to make a new decision.

## **Five Marks:**

1. Explain the central problems of economy.
2. Role of Managerial Economics.
3. Scope of Managerial Economies
4. Application of managerial economics in decision making
5. Difference between Micro and Macro Economics.
6. What is opportunity cost? Explain Production Possibility curve with suitable example.
7. Explain the concept of PPC and its link with opportunity cost.

## **Ten Marks:**

1. Explain the perspectives of managerial economics.
2. What are the functions of business managers? How does economics helps in business managers in performing their functions.
3. Write an essay on PPF.
4. Explain various theories of firm.



# DEMAND ANALYSIS AND CONSUMER BEHAVIOR

## MODULE 2



# MODULE 2

## DEMAND ANALYSIS AND CONSUMER BEHAVIOR

- Demand theory and analysis
- Elasticity of Demand and its role in Managerial decision making
- Demand forecasting, Techniques of Demand forecasting,
- Consumers Equilibrium
- Cardinal utility approach
- Indifference curve approach
- Theory of revealed preference, Consumer surplus

# Demand: Definition

- Demand may be defined as there must be **both desire to purchase and ability to pay** at per unit of time in the given price.
- Demand is an economic term that refers to the **amount of products or services that consumers wish to purchase at any given price level.**



- The mere **desire of a consumer** for a product is **not demand**. Demand includes the **purchasing power of the consumer** to acquire a given product at a given period.
- In other words, it's the amount of products or services that consumers are willing and able to purchase.



# Law of Demand

- The law of demand states that **other factors being constant (ceteris paribus)**, price and quantity demand of any good and service are **inversely** related to each other.
- When the price of a product increases, the demand for the same product will fall.

## LAW OF DEMAND



**These assumptions are:**

- (i) There is no change in the tastes and preferences of the consumer;
- (ii) The income of the consumer remains constant;
- (iii) There is no change in customs;
- (iv) The commodity to be used should not confer distinction on the consumer;
- (v) There should not be any substitutes of the commodity;

(vi) There should not be any change in the prices of other products;

(vii) There should not be any possibility of change in the price of the product being used;

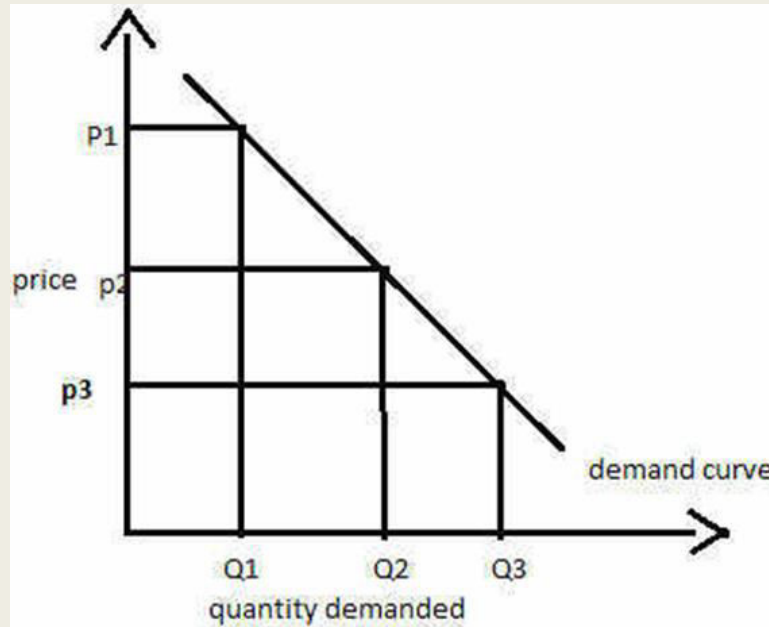
(viii) There should not be any change in the quality of the product; and

(ix) The habits of the consumers should remain unchanged.

Given these conditions, the law of demand operates. If there is change even in one of these conditions, it will stop operating.

# What Is the Demand Curve?

- The demand curve is a **graphical representation** of the relationship between the **price of a good or service and the quantity demanded** for a given period of time.
- In a typical representation, the price will appear on the left vertical axis, the quantity demanded on the horizontal axis.

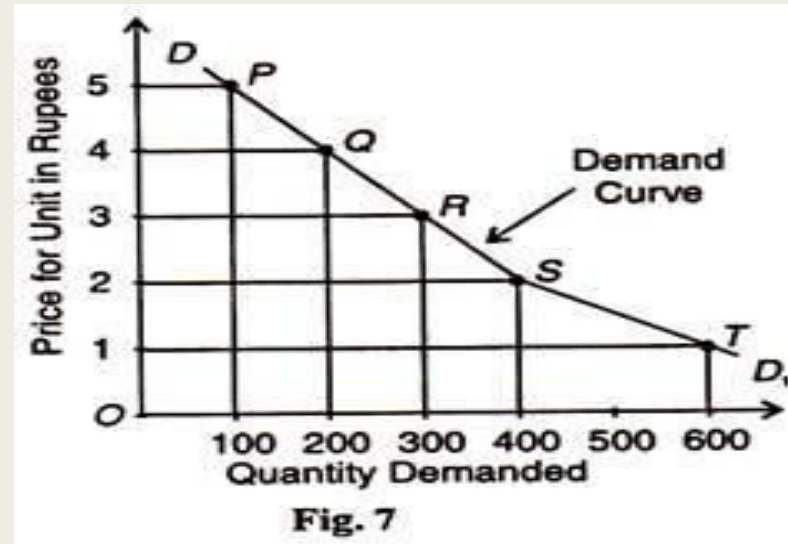


The above diagram shows the demand curve which is **downward sloping**. Clearly when the price of the commodity increases from price p3 to p2, then its quantity demand comes down from Q3 to Q2 and then to Q3 and vice versa.

# What Is the Demand Curve?

The law of demand is explained as follows:

Price (Rs)	Quantity Demanded
5	100 Units
4	200 Units
3	300 Units
2	400 Units
1	600 Units



The above table shows that when the price of say, orange, is Rs. 5 per unit, 100 units are demanded. If the price falls to Rs.4, the demand increases to 200 units. Similarly, when the price declines to Re.1, the demand increases to 600 units. On the contrary, as the price increases from Re. 1, the demand continues to decline from 600 units.

In the figure, point P of the demand curve DD1 shows demand for 100 units at the Rs. 5. As the price falls to Rs. 4, Rs. 3, Rs. 2 and Re. 1, the demand rises to 200, 300, 400 and 600 units respectively. This is clear from points Q, R, S, and T. Thus, the demand curve DD1 shows increase in demand of orange when its price falls. This indicates the inverse relation between price and demand.

# DEMAND SCHEDULE

- The demand schedule shows the functional relationship b/w the quantity of a commodity demanded and its price i.e. it shows the different quantities of a commodity demanded at various prices in a given time
- The demand schedule may be individual demand schedule or market demand schedule

# INDIVIDUAL DEMAND SCHEDULE

PRICE (Rs)	QUANTITY DEMAND
7	1
6	2
5	3
4	4
3	5
2	6
1	7

# MARKET DEMAND SCHEDULE

PRICE OF APPLE	QUANTITY DEMAND			MARKET DEMAND
	A	B	C	
6	5	5	40	50
5	10	15	45	70
4	15	25	50	90
3	20	35	55	110
2	25	45	60	130
1	30	55	65	150

# Demand Function:

Demand function is what describes a relationship between one variable and its determinants. It describes how much quantity of goods is purchased at alternative prices of good and related goods, alternative income levels, and alternative values of other variables affecting demand.

The principal variables that influence the quantity demanded of a good or service are

- (1) the price of the good or service,
- (2) the incomes of consumers,
- (3) the prices of related goods and services,
- (4) the tastes or preference patterns of consumers,
- (5) the expected price of the product in future periods, and
- (6) the number of consumers in the market.

Demand function shows the relationship between quantity demanded for a particular commodity and the factors influencing it.

# Demand Function:

## Individual Demand Function:

Individual demand function refers to the functional relationship between individual demand and the factors affecting individual demand. It is expressed as:

$$D_x = f(P_x, P_r, Y, T, F).$$

Where,

$D_x$  = Demand for Commodity x;

$P_x$  = Price of the given Commodity x;

$P_r$  = Prices of Related Goods;

$Y$  = Income of the Consumer;

$T$  = Tastes and Preferences;

$F$  = Expectation of Change in Price in future.

Demand function is just a way of saying that quantity demanded ( $D_x$ ), which is on the left-hand side, is assumed to depend on the variables that are listed on the right-hand side.

# Demand Function:

## Market Demand Function:

Market demand function refers to the functional relationship between market demand and the factors affecting market demand.

As mentioned before, market demand is affected by all factors affecting individual demand. In addition, it is also affected by size and composition of population, season and weather and distribution of income.

So, market demand function can be expressed as:

$$D_x = f(P_x, P_r, Y, T, F, P_D, S, D).$$

Where,

$D_x$  = Market demand of commodity x;

$P_x$  = Price of given commodity x;

$P_r$  = Prices of Related Goods;

$Y$  = Income of the consumers;

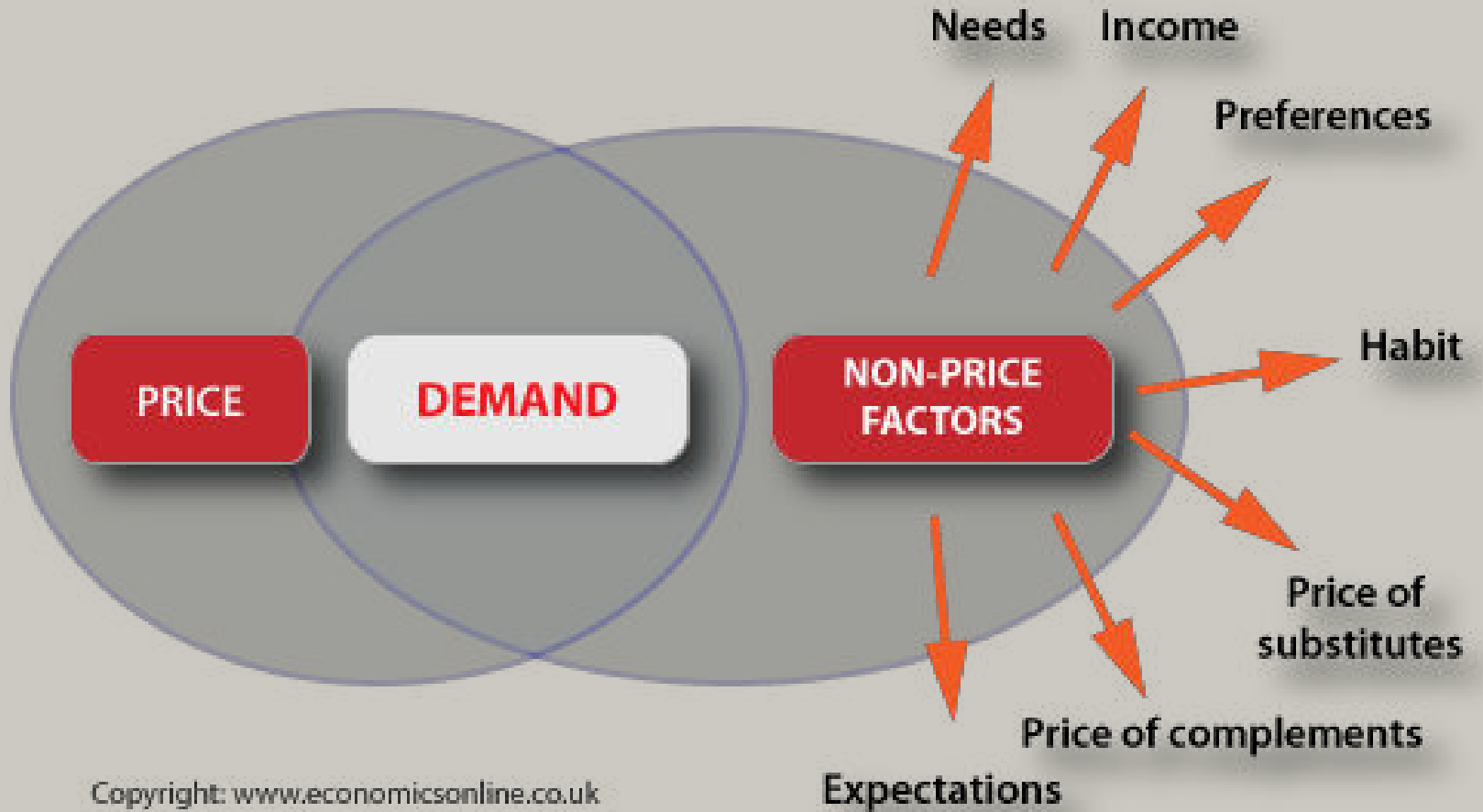
$T$  = Tastes and Preferences;

$F$  = Expectation of Change in Price in future;

$P_D$  = Size and Composition of population (Population Density);

$S$  = Season and Weather;

$D$  = Distribution of Income.



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# Change in Demand

- The demand for a good may change owing to a **change in its price** and it may also change because of a change in some other demand determinant, e.g., income.
- However, the nature of these two types of change in demand is not the same. The former results in a movement along a particular demand curve.

For example, if the demand curve for the good is  $D_1D_1$  in Fig., a change (fall) in price from  $p_1$  to  $p_2$  results in an increase in demand for the good from  $p_1F_1$  to  $p_2F_2$ , move downward towards right from the point  $F_1$  to  $F_2$  along the demand curve. Similarly, if there is a rise in price, rise upward towards left along the same demand curve.

# Change in Demand

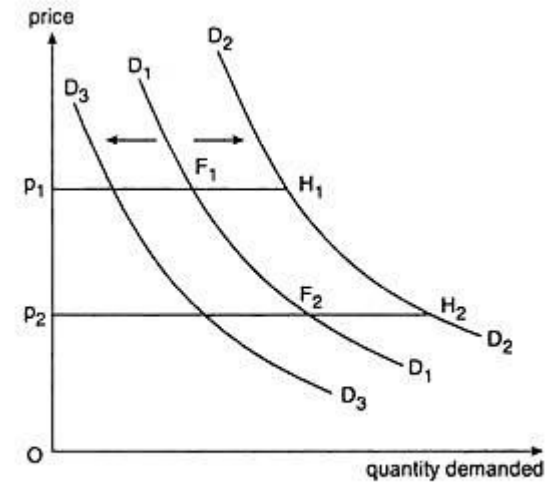


Fig. 1.6 Relationship between demand function and demand curve

- On the other hand, the second type of change in demand which happens because of a change in some demand determinant(s) other than (own) price of the good, results in a shift in the demand curve.
- For example, in Fig. 1.6, suppose that, initially, the demand curve for the good is  $D_1D_1$ . If now income of the buyers increases, the market demand for the good would also increase at each price.
- Suppose, at the price of  $p_1$ , demand increases from  $p_1F_1$  to  $p_1H_1$  and at the price of  $p_2$ , it increases from  $p_2F_2$  to  $p_2H_2$ . Therefore, after the increase in income the (market) demand curve for the good would shift rightward from  $D_1D_1$  to  $D_2D_2$ , the latter curve passing through the points  $H_1$ ,  $H_2$ , etc.

Similarly, if the income of the buyers decreases, the demand curve would shift to the left from the initial curve,  $D_1D_1$ , to a curve like  $D_3D_3$ .

# Change in Demand

- In order to make a difference between the two types of change in demand, two different names for these changes are used.
- Change in demand owing to a change in (own) price of the good is called change (increase or decrease) in quantity demanded.

As a result of this change, a movement takes place along the (same) demand curve.

- On the other hand, change in demand owing to a change in some demand determinant other than the (own) price, is called **shift(increase or decrease)** in demand-it may also be called **expansion or contraction in demand**.

As a result of this change, the demand curve for the good itself shifts to the right or to the left.

# Change in Demand

The determinants of demand that can lead to shift in the demand curve:

Income of the buyers

Consumer trends

Expectations of future price

The price of related goods

The number of potential buyers

# Reasons for the downward sloping demand curve

The following points highlight the seven main reasons for the downward sloping demand curve.

1. The law of demand is based on the **law of Diminishing Marginal Utility**. According to this law, when a consumer buys more units of a commodity, the marginal utility of that commodity continues to decline. Therefore, the **consumer will buy more units of that commodity only when its price falls**.

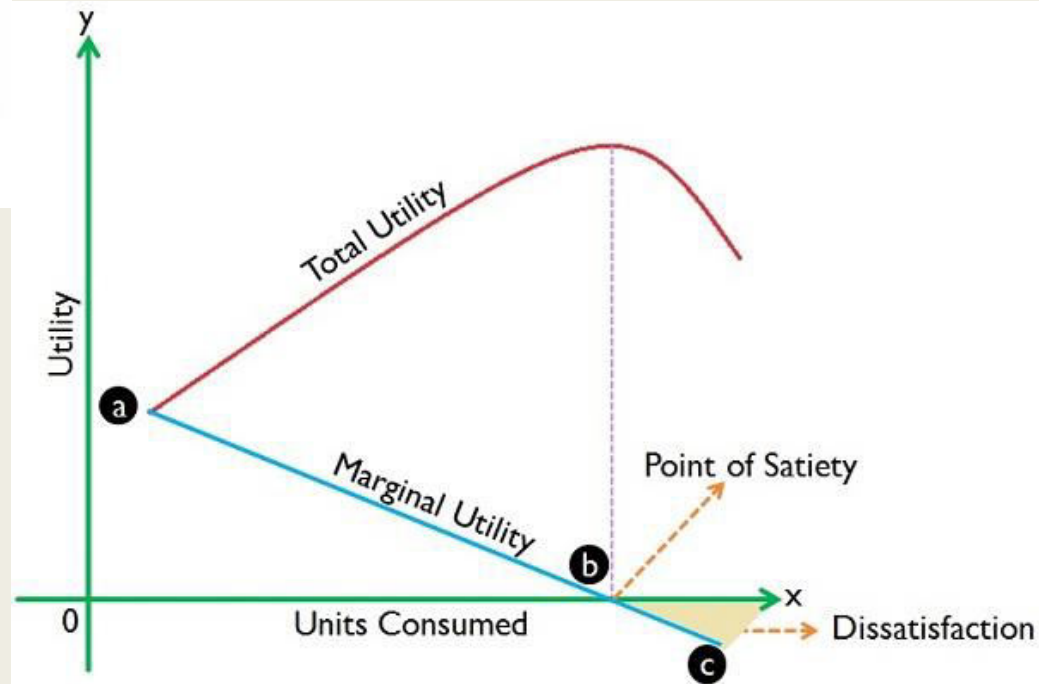
When less units are available, utility will be high and the consumer will be prepared to pay more for the commodity. This proves that the demand will be more at a lower price and it will be less at a higher price. That is why the demand curve is downward sloping.

2. Every commodity has certain consumers but when its **price** falls, new consumers start consuming it, as a result demand increases. On the contrary, with the increase in the price of the product, many consumers will either reduce or stop its consumption and the demand will be reduced. Thus, due to the price effect when consumers consume more or less of the commodity, the demand curve slopes downward.

## Tables

### Total and Marginal utility schedule

Units of apple	Total utility	Marginal utility
1	20	20
2	35	15
3	45	10
4	50	5
5	50	0
6	45	-5
7	35	-10



# Reasons for the downward sloping demand curve

3. When the **price of a commodity falls**, the **real income** of the consumer **increases** because he has to spend less in order to buy the same quantity. On the contrary, with the rise in the price of the commodity, the real income of the consumer falls. This is called the **income effect**.

For instance, with the fall in the price of milk, he will buy more of it but at the same time, he will increase the demand for other commodities. On the other hand, with the increase in the price of milk he will reduce its demand. The income effect of a change in the price of an ordinary commodity being positive, the demand curve slopes downward.

4. The other effect of **change of the price of the commodity** is the **substitution effect**. With the **fall in the price of a commodity, the prices of its substitutes remaining the same**, consumers will buy more of this commodity rather than the substitutes.

As a result, its demand will increase. On the contrary, with the rise in the price of the commodity (under consideration) its demand will fall, given the prices of the substitutes. For instance, with the fall in the price of tea, the price of coffee being unchanged, the demand for tea will rise, and contrariwise, with the increase in the price of tea, its demand will fall.

# Reasons for the downward sloping demand curve

5. There are **persons in different income groups in every society (Distribution of Income)** but the **majority is in low income group**. The downward sloping demand curve depends upon this group. Ordinary people buy more when price falls and less when price rises. The rich do not have any effect on the demand curve because they are capable of buying the same quantity even at a higher price.

6. There are **different uses of certain commodities and services** that are responsible for the negative slope of the demand curve. With the **increase in the price of such products**, they will be used only for more important uses and their demand will fall. On the contrary, with the fall in price, they will be put to various uses and their demand will rise.

For instance, with the increase in the electricity charges, power will be used primarily for domestic lighting, but if the charges are reduced, people will use power for cooking, fans, heaters, etc.

7. There is a **tendency to satisfy unsatisfied wants**. Each person has some unsatisfied wants. When the price of a good such as apple falls, he wants to satisfy his unsatisfied wants which leads him to increase its demand. Because of this tendency of human beings, the demand curve slopes downwards to the right.

# Exceptions to the Law of Demand



# Exceptions to the Law of Demand

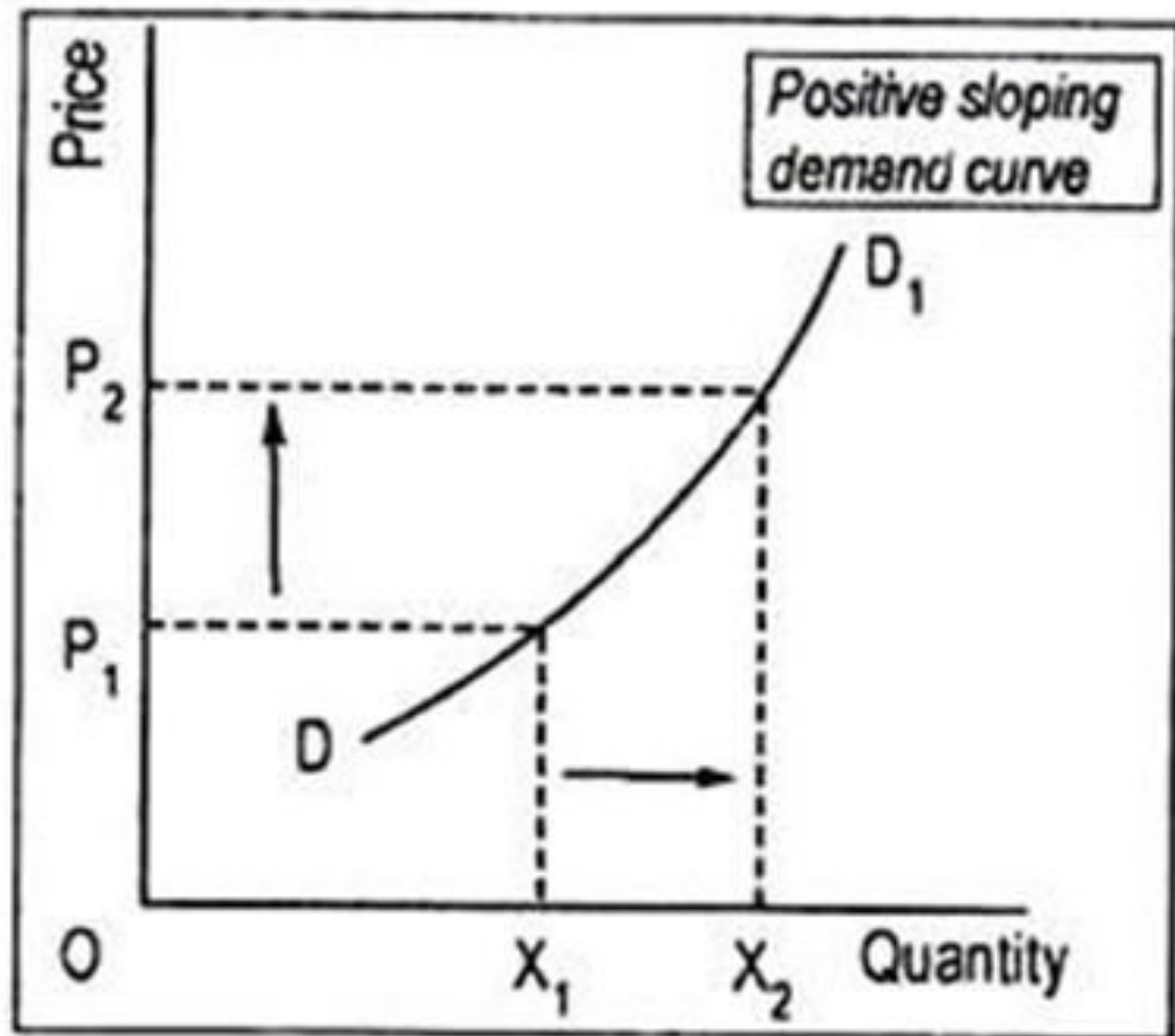
## 1. Giffen Goods:

- Giffen goods are the **inferior goods** whose demand increases with the increase in its prices.
- There are several inferior commodities, much cheaper than the superior substitutes often consumed by the poor households as an essential commodity.
- Whenever the price of the Giffen goods increases its quantity demanded also increases because, with an increase in the price, and the income remaining the same, the poor people cut the consumption of superior substitute and buy more quantities of Giffen goods to meet their basic needs.
- **For Example,** Suppose the minimum monthly consumption of food grains by a poor household is 20 Kg Bajra (Inferior good) and 10 Kg Rice (superior good). The selling price of Bajra is Rs 5 per kg, and the rice is Rs 10 per kg, and the household spends its total income of Rs 200 on the purchase of these items. Suppose, the price of Bajra rose to Rs 6 per kg then the household will be forced to reduce the consumption of rice by 5 Kg and increase the quantity of Bajra to 25 Kg in order to meet the minimum monthly requirement of food grains of 30 kg.

# Exceptions to the Law of Demand

## 2. Snob Appeal or Veblen Goods:

- Another exception to the law of demand is given by the economist Thorstein Veblen, who proposed the concept of “**Conspicuous Consumption.**”
- According to Veblen, there are a **certain group of people who measure the utility of the commodity purely by its price**, which means, they think that **higher priced goods and services derive more utility than the lesser priced commodities.**
- For example, goods like a diamond, platinum, ruby, etc. are bought by the upper echelons of the society (rich class) for whom the higher the price of these goods, the higher is the prestige value and ultimately the higher is the utility or desirability of them.
- This is a genuine exception to the law of demand.
- The demand curve for such an item will be upward sloping. Thus if, the price of diamond falls, people will buy less of it. In a word, purchasers value diamonds and other costly items because of their prices and because of the psychic satisfaction that they derive from it.



# Exceptions to the Law of Demand

3. **Expectation of Price Change in Future:** When the consumer expects that the price of a commodity is likely to further increase in the future, then he will buy more of it despite its increased price in order to escape himself from the pinch of much higher price in the future.

On the other hand, if the consumer expects the price of the commodity to further fall in the future, then he will likely postpone his purchase despite less price of the commodity in order to avail the benefits of much lower prices in the future.

4. **Ignorance:** Often, people who doesn't know the general price range in the market, will not recognize the increase in price and thus **prefer higher priced commodities than the better low-priced substitutes**. They buy those commodities whose price are relatively higher than the substitutes.

5. **Emergencies:** During emergencies such as war, natural calamity-flood, drought, earthquake, etc., the law of demand becomes ineffective. In such situations, people often fear the shortage of the essentials and hence demand more goods and services even at higher prices.

# Exceptions to the Law of Demand

6. **Change in fashion and Tastes & Preferences:** The change in fashion trend and tastes and preferences of the consumers negates the effect of law of demand. The consumer tends to buy those commodities which are very much in the market even at higher prices.
7. **Conspicuous Necessities:** There are certain commodities which have become essentials of the modern life. These are the goods which consumer buys irrespective of an increase in the price. For example TV, refrigerator, automobiles, washing machines, air conditioners, etc.
8. **Bandwagon Effect:** This is the most common type of exception to the law of demand wherein the **consumer tries to purchase those commodities which are bought by his friends, relatives or neighbors**. Here, the person tries to emulate the buying behavior and patterns of the group to which he belongs irrespective of the price of the commodity.

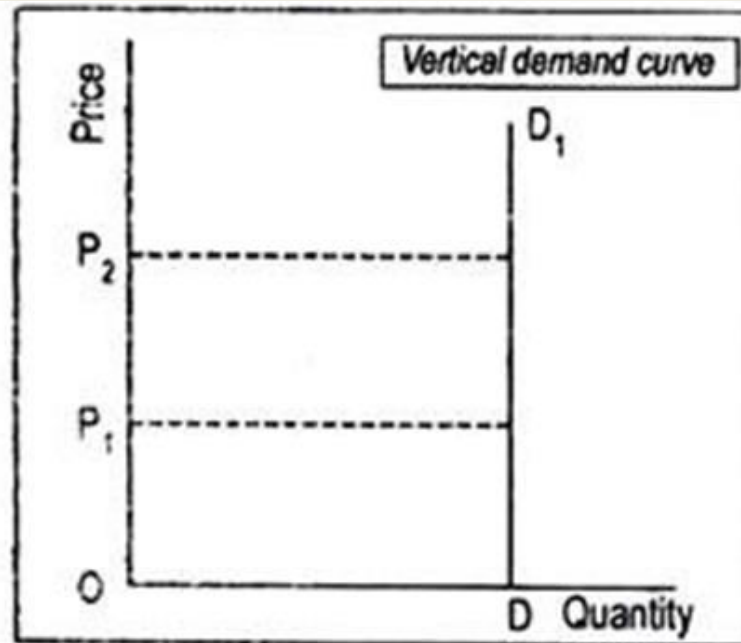
For example, if the majority of group members have smart phones then the consumer will also demand for the smartphone even if the prices are high.

# Exceptions to the Law of Demand

## 9. Highly Essential Good:

Finally, in case of certain highly essential items such as life-saving drugs, people buy a fixed quantity at all possible price. Heart patients will buy the same quantity of 'Sorbitrate' whether price is high or low. Their response to price change is almost nil.

In cases of such commodities, the demand curve is likely to be a vertical straight line. At a price  $OP_1$ , the heart patient consumer demands  $OD$  amount of 'Sorbitrate'. In spite of its price rise to  $OP_2$ , the consumer buys the same quantity of it.



# Determinants of Demand

1. Price of a Product or Service
2. Income
3. Prices of related goods or services
  - a. Substitutes
  - b. Complementary Goods
4. Tastes and Preferences of Consumers
5. Expectations of Consumers
6. Effect of Advertisements
7. Distribution of Income in the Society
8. Growth of Population
9. Government Policy
10. Climatic Conditions

# Determinants of Demand

## 1. Price of a Product or Service:

- The law of demand states that when prices rise, the quantity of demand falls. That also means that when prices drop, demand will grow. There is an inverse relationship between the price of a product and quantity demanded. The demand for a product decreases with increase in its price, while other factors are constant, and vice versa.

For example, consumers prefer to purchase a product (apple) in a large quantity (3kg) when the price of the product is less (1kg=75Rs.). On the other hand, the quantity demanded will decrease (2kg) if the price increases (1kg=100Rs).

## 2. Income:

The income of a consumer affects his/her purchasing power, which, in turn, influences the demand for a product. Increase in the income of a consumer would automatically increase the demand for products by him/her, while other factors are at constant, and vice versa.

When income rises, so will the quantity demanded. When income falls, so will demand. But if your income doubles, you won't always buy twice as much of a particular good or service. There's only so many pints of ice cream you'd want to eat, no matter how wealthy you are. That's where the concept of marginal utility comes into the picture. The first pint of ice cream tastes delicious. You might have another. But after that, the marginal utility starts to decrease to the point where you don't want any more.

For example, if the salary of Mr. X increases, then he may increase the pocket money of his children and buy luxury items for his family. This would increase the demand of different products from a single family. The income-demand relationship can be analyzed by grouping goods into four categories, namely, **essential consumer goods, inferior goods, normal goods, and luxury goods.**

# Determinants of Demand

## 3. Prices of related goods or services:

The demand for a specific product is influenced by the price of related goods to a greater extent. Related goods can be of two types, namely, substitutes and complementary goods, which are explained as follows:

### a. Substitutes:

- Refer to goods that satisfy the same need of consumers but at a different price. For example, tea and coffee, jowar and bajra, and groundnut oil and sunflower oil are substitute to each other.
- The increase in the price of a good results in increase in the demand of its substitute with low price. Therefore, consumers usually prefer to purchase a substitute, if the price of a particular good gets increased.

### b. Complementary Goods:

- Refer to goods that are consumed simultaneously or in combination. In other words, complementary goods are consumed together. For example, pen and ink, car and petrol, and tea and sugar are used together. Therefore, the demand for complementary goods changes simultaneously.
- The complementary goods are inversely related to each other. For example, increase in the prices of petrol would decrease the demand of cars.

# Determinants of Demand

## 4. Tastes and Preferences of Consumers:

- It plays a major role in influencing the individual and market demand of a product.
- The tastes and preferences of consumers are affected due to various factors, such as life styles, customs, common habits, and change in fashion, standard of living, religious values, age, and sex.

A change in any of these factors leads to change in the tastes and preferences of consumers. Consequently, consumers reduce the consumption of old products and add new products for their consumption. For example, if there is change in fashion, consumers would prefer new and advanced products over old-fashioned products, provided differences in prices are proportionate to their income.

When the public's desires, emotions, or preferences change in favour of a product, so does the quantity demanded. Likewise, when tastes go against it, which depresses the amount demanded. Brand advertising tries to increase the desire for consumer goods. For example, Buick spent millions to make you think its cars are not only for older people.

# Determinants of Demand

## 5. Expectations of Consumers:

Imply that **expectations of consumers about future changes** in the price of a product affect the demand for that product in the short run. For example,

- if consumers expect that the **prices of petrol would rise** in the next week, then the demand of petrol would increase in the present.
- On the other hand, consumers would delay the purchase of products whose **prices are expected to be decreased** in future, especially in case of non-essential products.
- Apart from this, if consumers **anticipate an increase in their income**, this would result in increase in demand for certain products.
- Moreover, the **scarcity of specific products** in future would also lead to increase in their demand in present.

# Determinants of Demand

## 6. Effect of Advertisements:

- Refers to one of the important factors of determining the demand for a product.
- Effective advertisements are helpful in many ways, such as catching the attention of consumers, informing them about the availability of a product, demonstrating the features of the product to potential consumers, and persuading them to purchase the product.
- Consumers are highly sensitive about advertisements as sometimes they get attached to advertisements endorsed by their favourite celebrities. This results in the increase demand for a product.

## 7. Distribution of Income in the Society:

- Influences the demand for a product in the market to a large extent.
- If income is equally distributed among people in the society, the demand for products would be higher than in case of unequal distribution of income. However, the distribution of income in the society varies widely.
- This leads to the high or low consumption of a product by different segments of the society. For example, the high income segment of the society would prefer luxury goods, while the low income segment would prefer necessary goods. In such a scenario, demand for luxury goods would increase in the high income segment, whereas demand for necessity goods would increase in the low income segment.

# Determinants of Demand

## **8. Growth of Population:**

Acts as a crucial factor that affect the market demand of a product. If the number of consumers increases in the market, the consumption capacity of consumers would also increase. Therefore, high growth of population would result in the increase in the demand for different products.

## **9. Government Policy:**

Refers to one of the major factors that affect the demand for a product. For example, if a product has high tax rate, this would increase the price of the product. This would result in the decrease in demand for a product. Similarly, the credit policies of a country also induce the demand for a product. For example, if sufficient amount of credit is available to consumers, this would increase the demand for products.

## **10. Climatic Conditions:**

Affect the demand of a product to a greater extent. For example, the demand of ice-creams and cold drinks increases in summer, while tea and coffee are preferred in winter. Some products have a stronger demand in hilly areas than in plains. Therefore, individuals demand different products in different climatic conditions.

# Types of DEMAND

- PRICE DEMAND
- INCOME DEMAND
- CROSS DEMAND
- DIRECT DEMAND
- INDIRECT/DERIVED DEMAND
- JOINT (OR) COMPLEMENTARY DEMAND
- COMPOSITE DEMAND
- COMPETITIVE DEMAND

# Types of DEMAND

## 1. Price demand:

- Price demand refers to the **different quantities of the commodity or service** which consumers will purchase at a given time and **at given prices**, assuming other things remaining the same.

## 2. Income demand:

- Income demand refers to the **different quantities of a commodity or service** which consumers will buy **at different levels of income**, assuming other things remaining constant.

## 3. Cross demand:

- When the **demand for a commodity depends not on its price but on the price of other related commodities**, it is called cross demand. Here we take closely connected or related goods which are substitutes for one another.

For example, tea and coffee are substitutes for one another. If the price of coffee rises, the consumer will be induced to buy more of tea and, hence, the demand of tea will increase.

But in case of complimentary or joint demand goods, e.g., pen and ink, horses and carriages etc. when the price of one commodity rises, the demand for it will fall and as a result of it the demand for the other joint commodity also falls (even though its price remains the same).

# Types of DEMAND

## 4. Direct demand:

- Commodities or services which **satisfy our wants directly** are said to have direct demand. For example, all consumer goods satisfy our wants directly, so they are said to have direct demand.

## 5. Derived demand or Indirect demand:

- Commodities or services demanded for producing goods which satisfy our wants directly are said to have derived demand. For example, demand for a factor of production (say labor) is a derived demand because labor is demanded to help in the construction of houses which will directly satisfy consumers' demand.

## 6. Joint demand:

- In finished products as in case of bread, there is need for so many things—the services of the flour mill, oven, fuel, etc. The demand for them is called joint demand.

## 7. Composite demand:

- A commodity is said to have a composite demand when its use is made in more than one purpose. For example the demand for coal is composite demand as coal has many uses—as fuel for a boiler of a factory, for domestic fuel, for oven for steam-making in railways engine, etc.

# Elasticity of Demand

- Demand elasticity (elasticity of demand) refers to how sensitive the demand for a good is to changes in other economic variables, such as prices and consumer income.
- Demand elasticity is calculated as the percent change in the quantity demanded divided by a percent change in another economic variable.
- A higher demand elasticity for an economic variable means that consumers are more responsive to changes in this variable.

The variables on which demand can depend on are:

- Price of the commodity
- Prices of related commodities
- Consumer's income, etc.

# Types of Elasticity

- The types of elasticity are:
  - Price Elasticity,
  - Income Elasticity and
  - Cross Elasticity.
- Price Elasticity is the responsiveness of demand to change in price;
- income elasticity means a change in demand in response to a change in the consumer's income; and
- cross elasticity means a change in the demand for a commodity owing to change in the price of another commodity.

# Price Elasticity of demand

## Price Elasticity of Demand

**Definition:** the effect of change in price on the quantity of demand.

$$\text{PED} = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}}$$



- Expressed mathematically, it is:

Price Elasticity of Demand = % Change in Quantity Demanded / % Change in Price

Elasticities can be usefully divided into three broad categories: elastic, inelastic, and unitary.

# Price Elasticity of demand

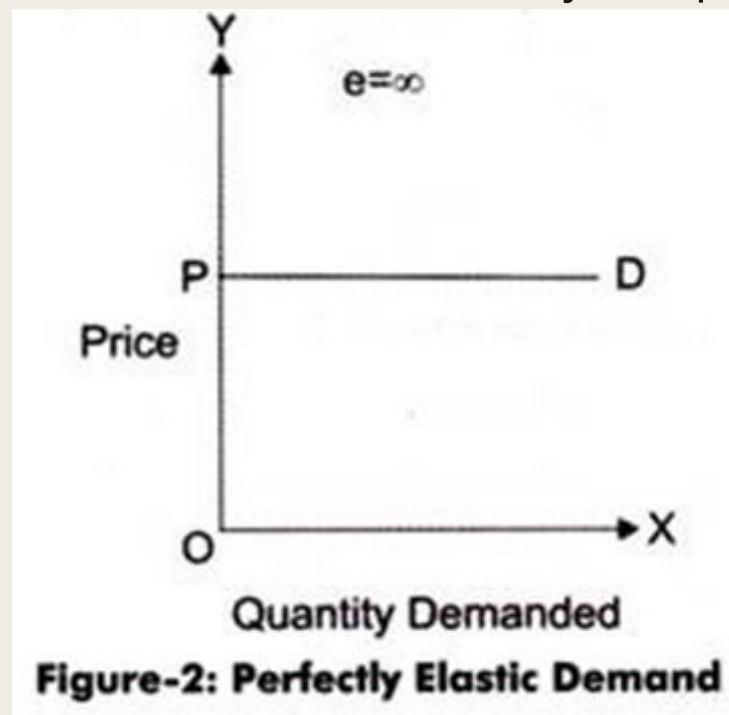
If ...	Then ...	And It Is Called . ..
$\% \text{ change in quantity} > \% \text{ change in price}$	$\frac{\% \text{ change in quantity}}{\% \text{ change in price}} > 1$	Elastic
$\% \text{ change in quantity} = \% \text{ change in price}$	$\frac{\% \text{ change in quantity}}{\% \text{ change in price}} = 1$	Unitary
$\% \text{ change in quantity} < \% \text{ change in price}$	$\frac{\% \text{ change in quantity}}{\% \text{ change in price}} < 1$	Inelastic

**Table** Elastic, Inelastic, and Unitary: Three Cases of Elasticity

# Types of Price Elasticity of demand

## 1. Perfectly Elastic Demand:

- When a **small change in price of a product causes a major change in its demand**, it is said to be **perfectly elastic demand**.
- In perfectly elastic demand, a **small rise in price** results in **fall in demand to zero**, while a **small fall in price** causes **increase in demand to infinity**. In such a case, the demand is perfectly elastic or  $e_p = \infty$ .
- Example: **Airline tickets** are sold in a fiercely competitive market.

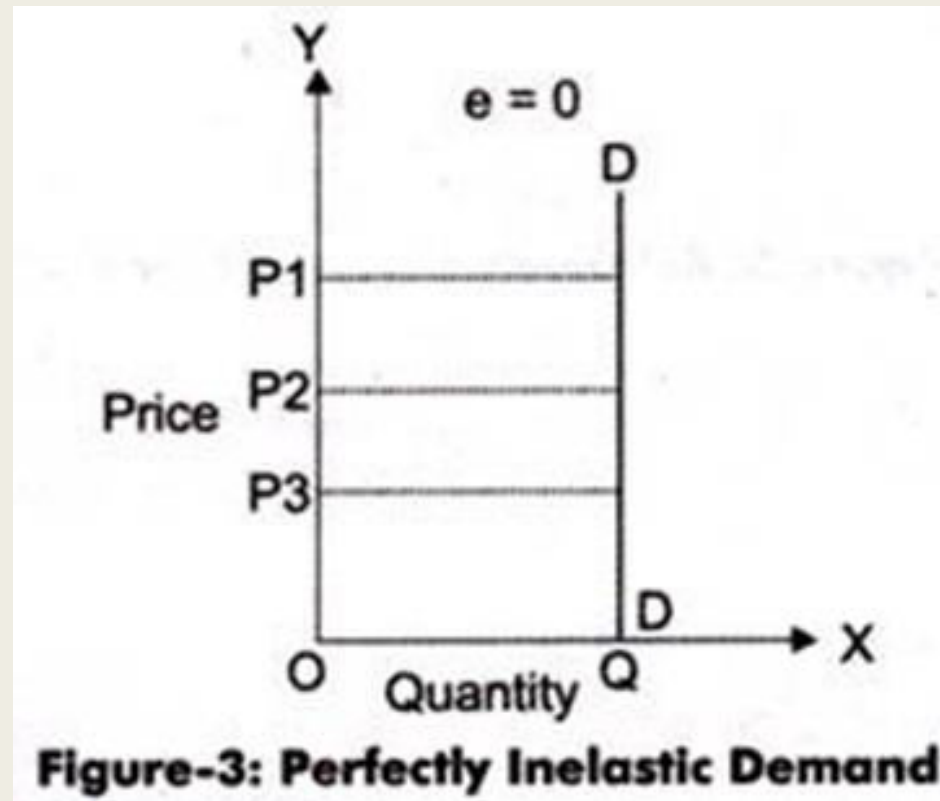


**Figure-2: Perfectly Elastic Demand**

# Types of Price Elasticity of demand

## 2. Perfectly Inelastic Demand:

- A **perfectly inelastic** demand is one when there is **no change** produced in the demand of a product with change in its price. The numerical value for perfectly inelastic demand is zero ( $e_p=0$ ).
- Example: Gas, Movie Ticket



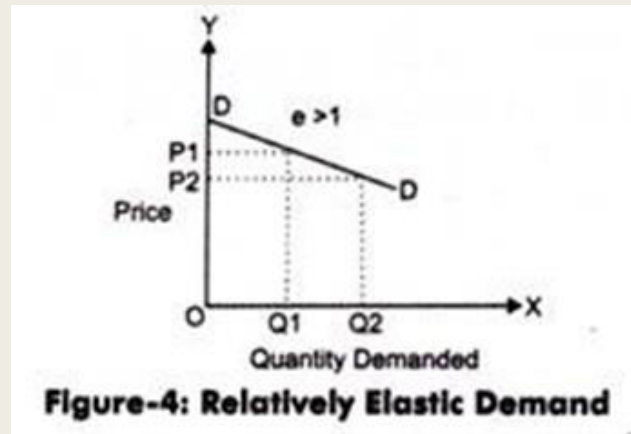
**Figure-3: Perfectly Inelastic Demand**

# Types of Price Elasticity of demand

## 3. Relatively Elastic Demand:

- **Relatively elastic demand** refers to the demand when the **proportionate change produced in demand is greater than the proportionate change in price** of a product.
- The numerical value of relatively elastic demand ranges between one to infinity. Mathematically, relatively elastic demand is known as more than unit elastic demand ( $e > 1$ ).
- Example: Air-travel for vacationers is very sensitive to price.

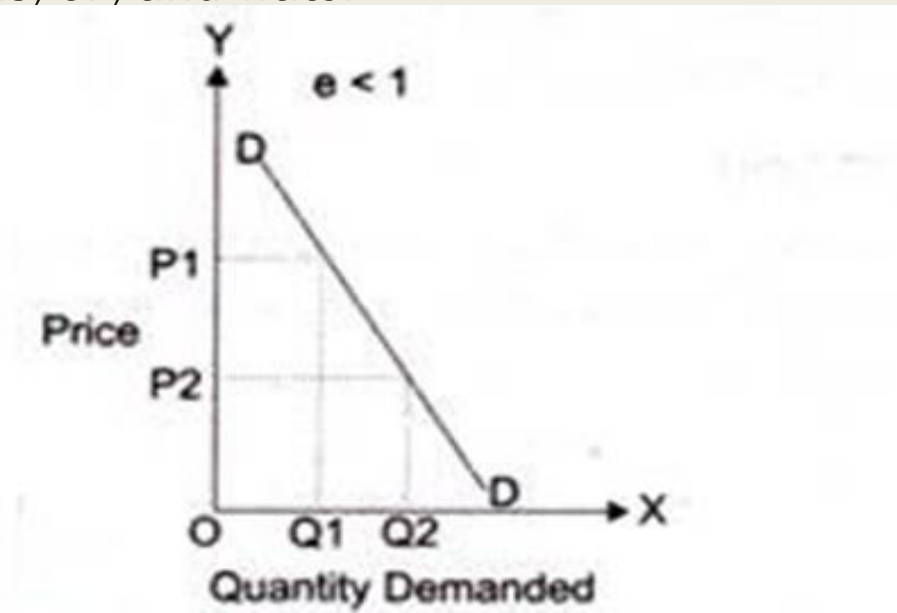
The price of a particular brand of cold drink increases from Rs. 15 to Rs. 20.



# Types of Price Elasticity of demand

## 4. Relatively Inelastic Demand:

- **Relatively inelastic demand** is one when the **percentage change produced in demand is less than the percentage change in the price** of a product. If the **price of a product increases by 30%** and the **demand for the product decreases only by 10%**, then the demand would be called relatively inelastic.
- The numerical value of relatively elastic demand ranges between zero to one ( $e < 1$ ).
- Example: Electricity, gas, oil, and water.



# Income elasticity of demand:

Income elasticity of demand refers to the sensitivity of the **quantity demanded** for a certain good **to a change in real income of consumers** who buy this good, keeping all other things constant.

$$D_n = f(Y)$$

The formula for calculating income elasticity is:

Mathematically, it is expressed as:

$$\text{Income elasticity of demand} = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}}$$

Symbolically, it is expressed as:

$$E_Y = \frac{\Delta q}{\Delta y} \times \frac{y}{q}$$

# Types of Income Elasticity of demand

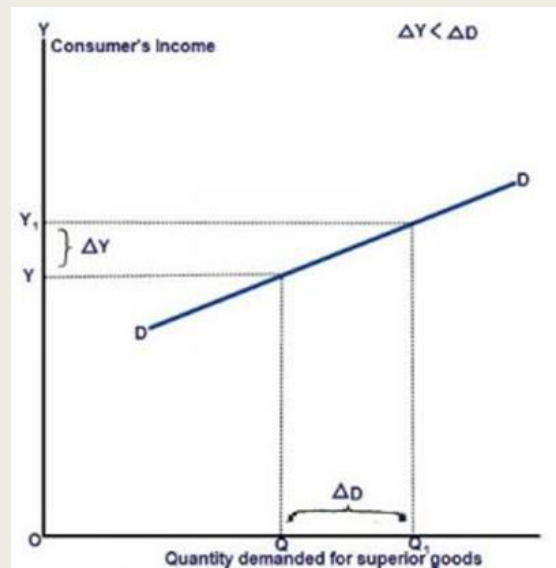
## 1. Positive income elasticity of demand ( $E_Y > 0$ )

- If there is **direct relationship** between income of the consumer and demand for the commodity, then income elasticity will be **positive**.
- For example: as the income of consumer increases, they consume more of superior (luxurious) goods. On the contrary, as the income of consumer decreases, they consume less of luxurious goods.
- Positive income elasticity can be further classified into **three types**:

# Types of Income Elasticity of demand

## Income elasticity greater than unity ( $E_Y > 1$ )

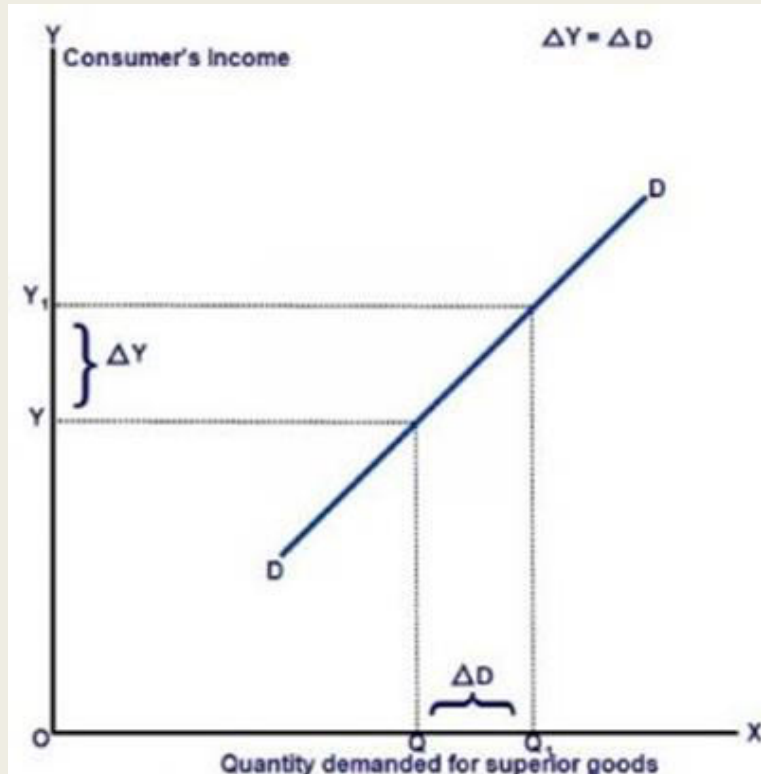
- If the percentage change in quantity demanded for a commodity is **greater than** percentage change in income of the consumer, it is said to be income greater than unity. When the consumer's income rises by 3% and the demand rises by 7%, it is the case of income elasticity greater than unity.
- For example: Luxury Goods



# Types of Income Elasticity of demand

## Income elasticity equal to unity ( $E_Y = 1$ )

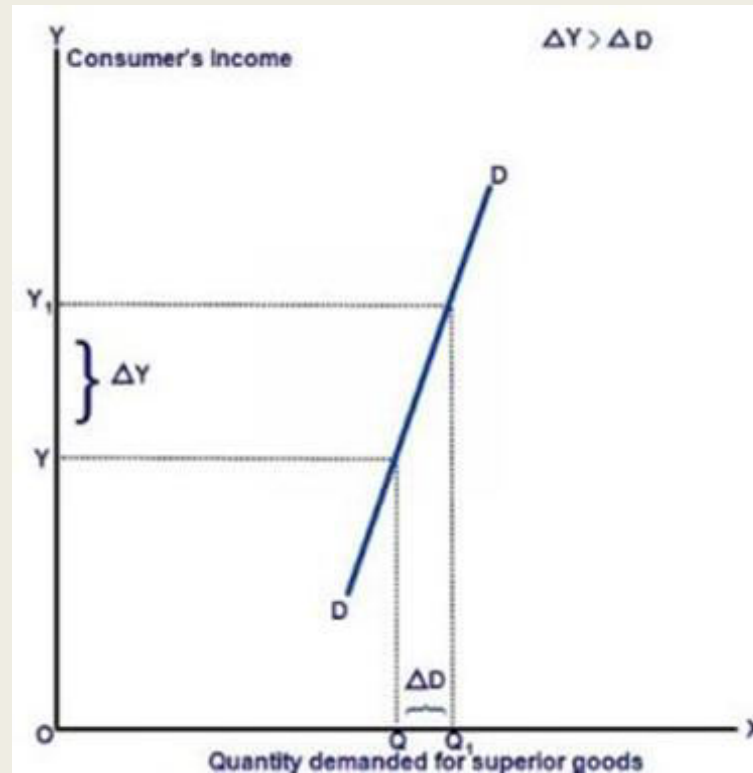
- If the percentage change in quantity demanded for a commodity is **equal to** percentage change in income of the consumer, it is said to be income elasticity equal to unity.
- When the consumer's income rises by 5% and the demand rises by 5%, it is the case of income elasticity equal to unity.
- For example:



# Types of Income Elasticity of demand

## Income elasticity less than unity ( $E_Y < 1$ )

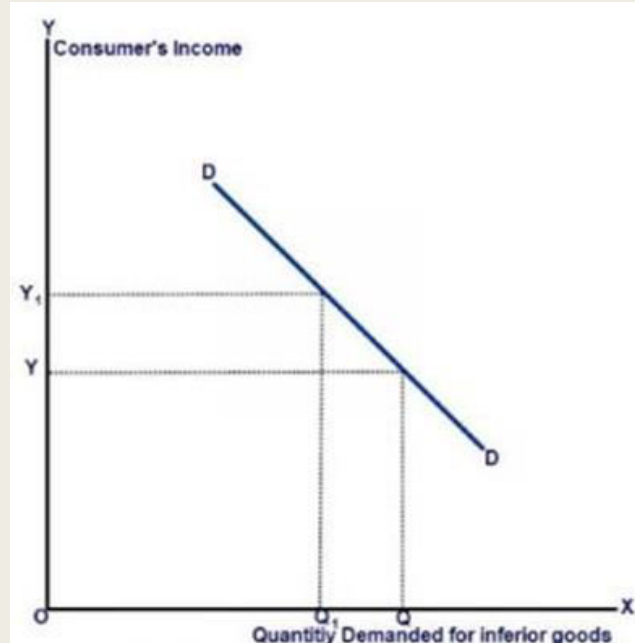
- If the percentage change in quantity demanded for a commodity **is less than** percentage change in income of the consumer, it is said to be income greater than unity.
- When the consumer's income rises by 5% and the demand rises by 3%, it is the case of income elasticity less than unity.
- For example:



# Types of Income Elasticity of demand

## 2. Negative income elasticity of demand ( $E_Y < 0$ )

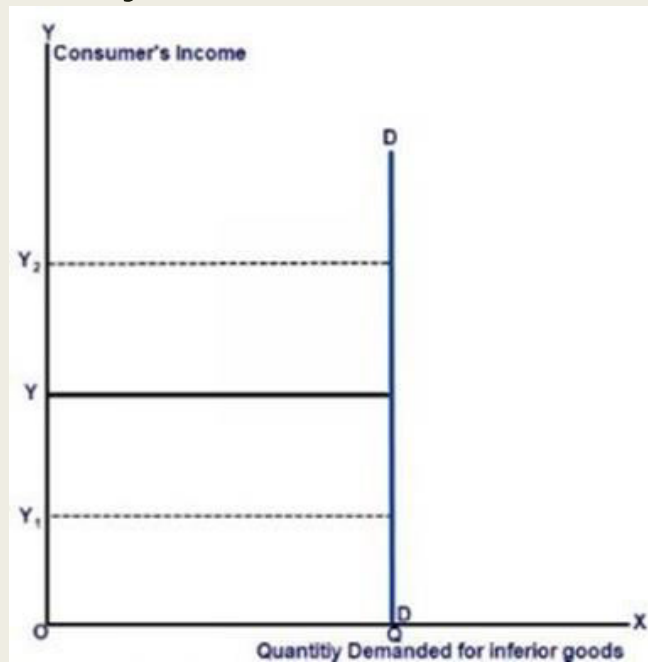
- If there is inverse relationship between income of and demand, i.e., if the quantity demanded for a commodity decreases with the rise in income of the consumer and vice versa.
- For example: As the income of consumer increases, they either stop or consume less of **inferior goods**.



# Types of Income Elasticity of demand

## 3. Zero income elasticity of demand ( $E_Y=0$ )

- If the quantity demanded for a commodity remains constant with any rise or fall in income of the consumer and, it is said to be zero income elasticity of demand.
- For example: In case of basic **necessary goods** such as salt, kerosene, electricity, etc. there is zero income elasticity of demand.



# CROSS ELASTICITY OF DEMAND

Cross demand refers to the changes in quantity demanded of a goods or services. Related goods can be substitute goods or complementary goods. Other things remaining constant cross demand , therefore is the changes in the quantity demanded of a commodity due to the changes in the price of a substitute or complementary goods

$$D_x = f(P_y)$$

❖ Substitute Goods

❖ Complementary Good

The Formula for Cross Elasticity of Demand Is

$$E_c = \frac{P_1^A + P_2^A}{Q_1^B + Q_2^B} \cdot \frac{\Delta Q^B}{\Delta P^A}$$

where:

$P_1^A$  = Price of good A at time 1

$P_2^A$  = Price of good A at time 2

$Q_1^B$  = Quantity demanded of good B at time 1

$Q_2^B$  = Quantity demanded of good B at time 2

$\Delta Q^B$  = Change in the quantity demanded for good B

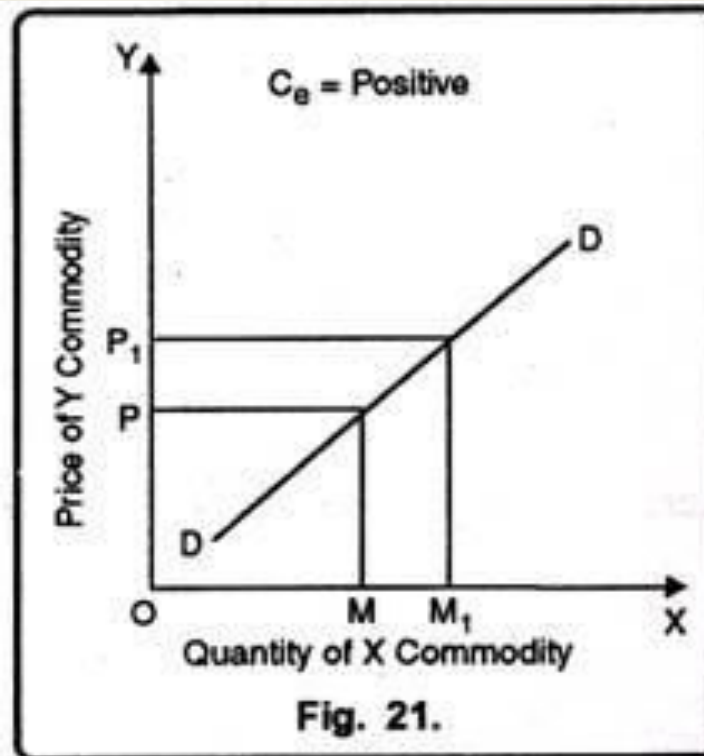
$\Delta P^A$  = Change in the price of good A

$$C_e = \frac{\text{Proportionate change in the quantity demanded of Y}}{\text{Proportionate change in the price of X}}$$

# CROSS ELASTICITY OF DEMAND

## 1. Positive:

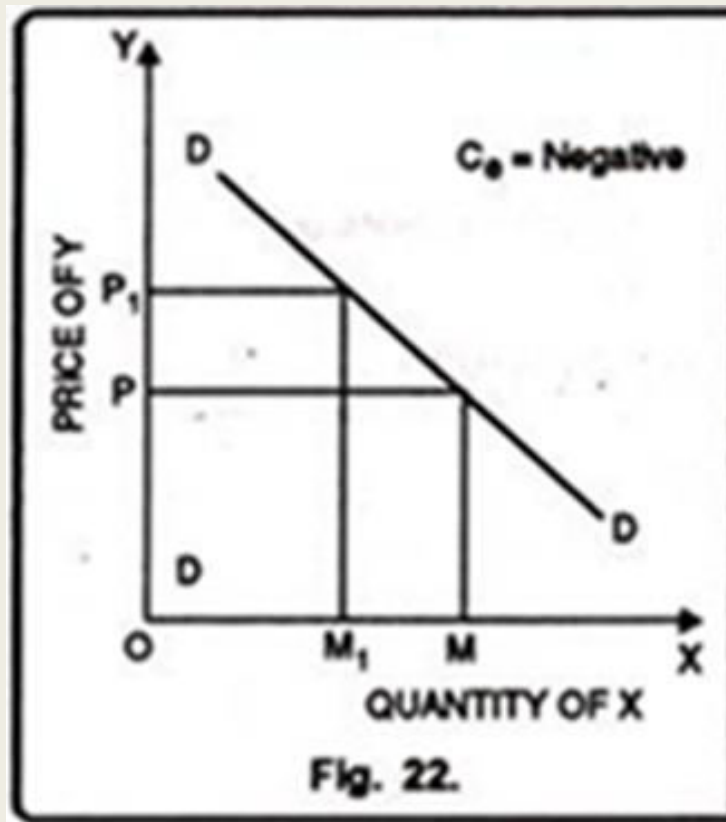
- When goods are substitute of each other then cross elasticity of demand is positive. In other words, when an increase in the price of Y leads to an increase in the demand of X.
- For instance, with the increase in price of tea, demand of coffee will increase.



# CROSS ELASTICITY OF DEMAND

## 2. Negative:

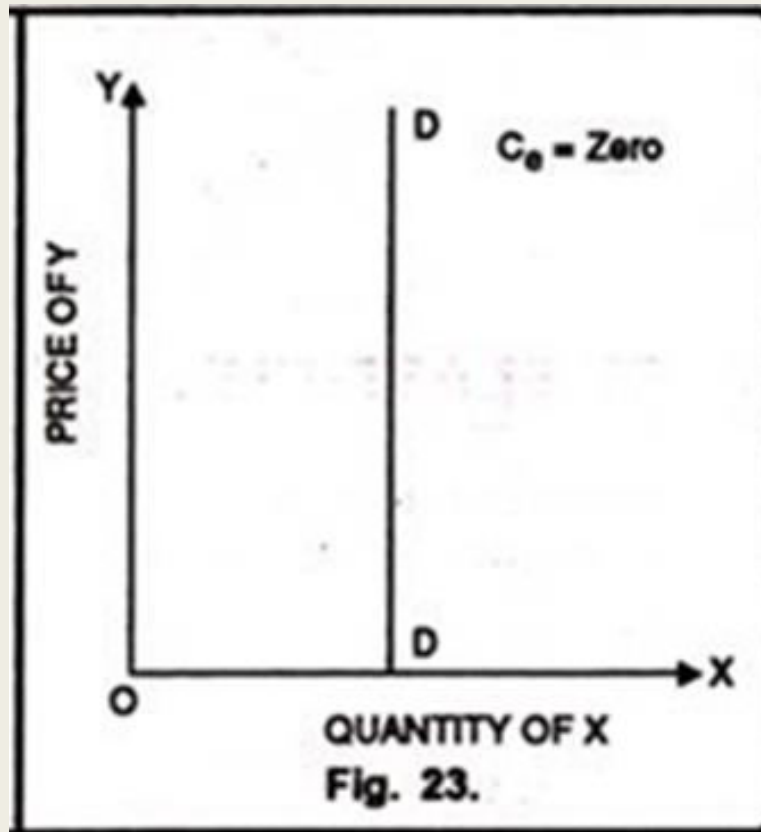
- In case of complementary goods, cross elasticity of demand is negative.
- A proportionate increase in price of one commodity leads to a proportionate fall in the demand of another commodity because both are demanded jointly.



# CROSS ELASTICITY OF DEMAND

## 3. Zero:

- Cross elasticity of demand is zero when two goods are not related to each other. For instance, increase in price of car does not effect the demand of cloth.



# Determinants of Elasticity

- **Time period** – the longer the time under consideration the more elastic a good is likely to be
- **Number and closeness of substitutes** – the greater the number of substitutes, the more elastic
- **The proportion of income taken up by the product** – the smaller the proportion the more inelastic
- **Urgency of Need**
- **Nature of Goods or service(Luxury or Necessity)** -

# Elasticity of Demand and its role in Managerial decision making

1. Wage Bargaining/Fixation
2. To understand the effect of Automation
3. Price Fixation
4. Excise Duty
5. Factor Pricing:
6. Fixation of Price Floor for agricultural products:

# Elasticity of Demand and its role in Managerial decision making

## 1. Wage Bargaining/Fixation:

- For a company in an industry **where demand is elastic, wage rise is challenging** because the company will have to bear the burden on increased cost, because if the burden is passed on to consumers in form of increased price, then the demand of the product will fall.
- Thus a wage rise is economically feasible in the food industry than in the automobile sector.

## 2. To understand the effect of Automation:

- Suppose a firm introduces Automation. This may make 100 workers unemployed.
- However, a part of the cost reduction due to the impact of automation (i.e., rapid technological advance) is passed on the consumers in the form of lower price of the product.
- If the demand for the product is **elastic**, a small price cut will lead to more than proportionate increase in demand.
- As a result output may increase to such an extent that 100 unemployed workers or even more are reabsorbed by the firm.
- If demand is **inelastic**, few or no workers can be reemployed, because the decrease in price will not have much increase in the volume of firm's business.

# Elasticity of Demand and its role in Managerial decision making

## 3. Price Fixation:

- In case of a product with **relatively elastic product**, he should carefully consider increasing price even when there is high demand. This is because, **a small rise in price can have a relatively greater impact** on the demand.
- On the other hand, in case of a product with **relatively inelastic demand**, the company can **capitalise on the market opportunities by raising price** and thus earning more revenue.

## 4. Excise Duty:

The main purpose of a tax on a commodity may be either:

- (a) To raise its price in order to reduce consumer's demand or
- (b) To raise revenue.

- The first objective is likely to be fulfilled if demand for the commodity is elastic.
- Thus a higher tax on a product, the demand for which is elastic, will reduce the tax revenue of the government. However, the usual objective of taxation is to raise revenue.
- This objective is achieved by imposing a tax on such commodities as oil, cigarettes and liquor. The demand for those goods is inelastic and the government known that an increase in the taxes on these goods will not result in large fall in demand and consequently tax revenue.

# Elasticity of Demand and its role in Managerial decision making

## 5. Factor Pricing:

- If demand for a particular factor is **inelastic** as compared to the other factors, then **it will attract more rewards**. Eg: We can observe that the demand for highly skilled and specialised labour like Pilot is relatively inelastic and thus they demand higher pay.

## 6. Fixation of Price Floor for agricultural products:

- Elasticity of demand helps the government in **understanding the inelastic nature of agricultural produce**.
- A bumper crop, instead of bringing prosperity to farmers, brings poverty. This is called the paradox of poverty amidst plenty.
- It happens due to inelastic demand for most of the agricultural products. When supply of crops increases as a result of rich harvest, their prices drastically fall due to inelastic demand.
- As a result, their total income goes down, leading to poverty.
- Understanding this will help the government to take decision regarding fixation of price floor to protect the interest of farmers.

# Demand Forecasting

- Demand Forecasting is the process in which **historical sales data** is used to develop an **estimate of an expected forecast** of customer demand.

Major types of Demand Forecasting:

- **Passive Demand Forecasting**
- **Active Demand Forecasting**
- **Short-term Demand Forecasting**
- **Medium to long-term Demand Forecasting:**
- **External macro level Demand Forecasting:**
- **Internal business level Demand Forecasting:**

# Demand Forecasting

- Demand Forecasting is the process in which historical sales data is used to develop an estimate of an expected forecast of customer demand.

Major types of Demand Forecasting:

- **Passive Demand Forecasting:**
  - Carried out for **stable businesses** with very **conservative growth** plans.
  - limited to small and local businesses.
- **Active Demand Forecasting:**
  - Carried out for **scaling and diversifying businesses** with aggressive growth plans in terms of **marketing activities, product portfolio expansion and consideration of competitor activities and external economic environment.**
- **Short-term Demand Forecasting:**
  - Carried out for a shorter term period of **3 months to 12 months.**
  - In the short term, **the seasonal pattern of demand and the effect of tactical decisions** on the customer demand are taken into consideration.

# Demand Forecasting

- **Medium to long-term Demand Forecasting:**
  - Carried out for more than **12 months to 24 months** in advance (**36-48 months** in certain businesses).
  - Long-term Forecasting drives the **business strategy planning, sales and marketing planning, financial planning, capacity planning, capital expenditure**, etc.
- **External macro level Demand Forecasting:**
  - Deals with the **broader market movements** which depend on the **macroeconomic environment**.
  - External Forecasting is carried out for evaluating the **strategic objectives** of a business like product portfolio expansion, entering new customer segments, technological disruptions, a paradigm shift in consumer behavior and risk mitigation strategies.
- **Internal business level Demand Forecasting:**
  - Deals with **internal operations** of the business such as product category, sales division, financial division, and manufacturing group. This includes annual sales forecast, estimation of COGS, net profit margin, cash flow, etc.

# Objectives of Demand Forecasting:

## **i. Short-term Objectives:**

- a. Formulating production policy
- b. Formulating price policy
- c. Controlling sales
- d. Arranging finance

## **ii. Long-term Objectives:**

- a. Deciding the production capacity:
- b. Planning long-term activities:

# Objectives of Demand Forecasting:

## i. Short-term Objectives:

### a. Formulating production policy:

- Helps in covering the gap between the demand and supply of the product.
- Similarly, human resource requirements are easily met with the help of demand forecasting.

### b. Formulating price policy:

- An organization sets prices of its products according to their demand.

### c. Controlling sales:

- Helps in setting sales targets, which act as a basis for evaluating sales performance.

### d. Arranging finance:

- Estimation of Financial requirements. This helps in ensuring proper liquidity within the organization.

# Objectives of Demand Forecasting:

## ii. Long-term Objectives:

### a. Deciding the production capacity:

- Organization can determine the size of the plant required for production.

### b. Planning long-term activities:

- Implies that demand forecasting helps in planning for long term.
- For example, if the **forecasted demand** for the organization's products **is high**, then it may plan to **invest in various expansion and development projects** in the long term.

# Significance of Demand Forecasting:

- i. Fulfilling objectives
- ii. Preparing the budget
- iii. Stabilizing employment and production
- iv. Expanding organizations
- v. Taking Management Decisions
- vi. Evaluating Performance
- vii. Helping Government

# Significance of Demand Forecasting:

## i. Fulfilling objectives:

- For example, an organization has set a target of selling 50,000 units of its products.

## ii. Preparing the budget:

- Plays a crucial role in making budget **by estimating costs and expected revenues.**
- For instance, an organization has forecasted that the demand for its product, which is priced at Rs. 10, would be 10,00,000 units. In such a case, the total expected revenue would be  $10 * 1000000 = \text{Rs. } 10,00,000$ .

## iii. Stabilizing employment and production:

- Helps an organization to **control its production and recruitment activities.**
- For example, if an organization expects a rise in the demand for its products, it may opt for extra labor to fulfill the increased demand.

# Significance of Demand Forecasting:

## iv. Expanding organizations:

- If the expected demand for products is **higher**, then the organization may plan to **expand further**.
- On the other hand, if the demand for products is **expected to fall**, the organization **may cut down** the investment in the business.

## v. Taking Management Decisions:

- Helps in making critical decisions, such as deciding the **plant capacity, determining the requirement of raw material, and ensuring the availability of labor and capital**.

## vi. Evaluating Performance:

- For example, if the **demand for an organization's** products **is less**, it may take corrective actions and improve the level of demand by enhancing the quality of its products or spending more on advertisements.

## vii. Helping Government:

- Enables the government to **coordinate import and export activities and plan international trade**.

# Demand forecasting methods

Demand can be forecasted using (A) Qualitative methods or (B) Quantitative methods as explained below:

## Qualitative methods:

The qualitative method is when you forecast demand when there is no prior data or sales numbers to work with by using the opinions of a group of experts.

### 1.The Delphi Technique:

- A **panel of experts are appointed** to produce a Demand Forecast.
- Each expert is asked to **generate a forecast** of their assigned specific segment.
- After the initial forecasting round, **each expert reads out their forecast and in the process, each expert is influenced by other experts.**
- A consequent forecast is again made by **all experts and the process is repeated until all experts** reach a near consensus scenario.

# Demand forecasting methods

## Qualitative methods:

### 2. Consumer's Survey Method or Survey of Buyer's Intentions:

- In this method, the **consumers are directly approached** to disclose their future purchase plans.
- This is done by **interviewing all consumers or a selected group of consumers** out of the relevant population.
- This is the direct method of estimating demand in the short run.
- Here the **burden of forecasting is shifted to the buyer**. The firm may go in for complete enumeration or for sample surveys.
- If the commodity under consideration is an intermediate product then the industries using it as an end product are surveyed.

#### (i) Complete Enumeration Survey:

- Under the Complete Enumeration Survey, the firm has to go for a **door to door survey** for the forecast period by contacting **all the households in the area**.
- This method has an advantage of first hand, unbiased information, yet it has its share of disadvantages also. The major limitation of this method is that it requires lot of resources, manpower and time.
- In this method, **consumers may be reluctant to reveal their purchase plans** due to personal privacy or commercial secrecy.
- Moreover, at times the consumers may not express their opinion properly or may deliberately misguide the investigators.

# Demand forecasting methods

## Qualitative methods:

### 2. Consumer's Survey Method or Survey of Buyer's Intentions:

#### (ii) Sample Survey and Test Marketing:

- Under this method some **representative households are selected on random basis as samples and their opinion** is taken as the generalized opinion.
- This method is based on the basic assumption that the sample truly represents the population. This method is less tedious and less costly.
- A variant of sample survey technique is **test marketing**.
- These are suitable for new products or for radically modified old products for which no prior data exists.
- It is a more scientific method of estimating likely demand because it stimulates a national launch in a closely defined geographical area.

#### (iii) End Use Method or Input-Output Method:

- This method is quite **useful for industries** which are mainly producer's goods.
- In this method, the **sale of the product under consideration** is projected as the basis of demand **survey of the industries using this product as an intermediate product**, that is, the demand for the final product is the end user demand of the intermediate product used in the production of this final product.
- The end user demand estimation of an intermediate product may involve many final good industries using this product at home and abroad.
- It helps us **to understand inter-industry' relations**. In input-output accounting two matrices used are the transaction matrix and the input co-efficient matrix.
- The major efforts required by this type are not in its operation but in the collection and presentation of data.

# Demand forecasting methods

Qualitative methods:

## 3. Sales Force Opinion:

- The Sales Manager **asks for inputs of expected demand** from each Salesperson in their team.
- Each Salesperson **evaluates** their respective **region and product categories and** provides their **individual customer demand**.
- Eventually, the Sales Manager aggregates all the demands and generates the final version of Demand Forecast after management's judgment.

## 4. Market Research:

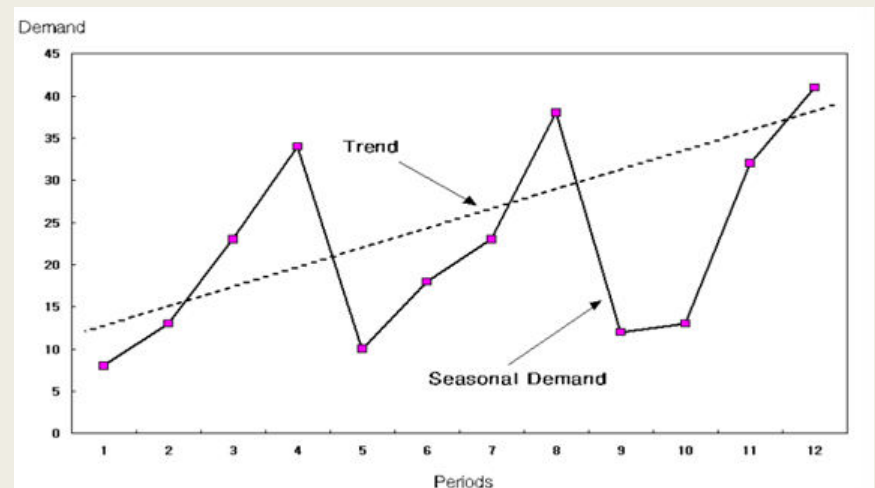
- In market research technique, **customer-specific surveys** are deployed to generate potential demand.
- Such surveys are generally in the form of questionnaires that directly seeks personal, demographic, preference and economic information from end customers.
- Since this type of research is on a random sampling basis, care needs to be exercised in terms of the survey regions, locations, and demographics of the end customer.
- This type of method could be beneficial for **products that have little to no demand history**.

# Demand forecasting methods

- Quantitative methods:

1. Trend projection method:

- Effectively deployed for businesses with a **large sales data history** of typically more than **18 to 24 months**.
- This historical data generates a “time series” which represents the past sales and projected demand using **graphical plotting method or the least square method**.
- Time series analysis is based on data relating to past demand used to predict future demand. It include several components, such as **trend, seasonal, or cyclical influences**.
- **Moving Average, Weighted Average etc.**



# Demand forecasting methods

## ■ Quantitative methods:

### 2. Barometric technique:

- It is based on the principle of **recording events in the past and present to predict the future**.
- This is accomplished by analyzing the statistical and economic indicators.
- When the **estimation on a certain time series is done through observations on another time series**. This method uses various indicators **to predict the future**.
- Forecasters deploy statistical analysis like Leading series, Concurrent series or Lagging series to generate the Demand Forecast.

**Leading series (indicator):** When an event that has **already happened is used to predict** the future, then the already happened event would act as a leading indicator.

**Coincident series (indicator):** A coincident indicator is an economic statistical indicator that **changes (more or less) simultaneously with general economic conditions** and therefore reflects the current status of the economy. Typical examples of coincident indicators are industrial production or turnover.

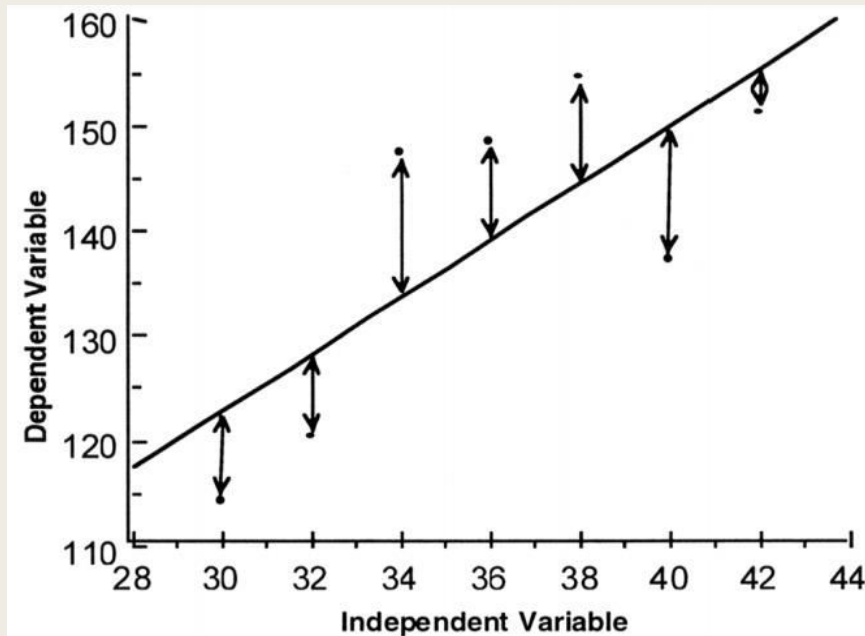
**Lagging series (indicator):** A lagging indicator is a financial sign that becomes apparent only after a large shift has taken place. Lagging indicators tell you about **what has already happened**. Therefore, lagging indicators confirm long-term trends, but they do not predict them.

# Demand forecasting methods

- Quantitative methods:

- 3. Econometric forecasting technique:

- It utilizes **autoregressive integrated moving-average and complex mathematical equations**, to establish **relationships between demand and factors** that influence the demand.
- An equation is derived and fine-tuned to ensure a reliable historical representation.
- Finally, the projected values of the influencing variables are inserted into the equation to generate a forecast. Example Regression,



# Consumer Equilibrium

- Consumer Equilibrium is a state at which a **consumer derives maximum utility from the consumption** of one or more goods and services **at a particular level of income**.
- When **consumers** make choices about the quantity of goods and services to consume, it is presumed that their objective is **to maximize total utility**.
- In maximizing total utility, the consumer faces a **number of constraints**, the most important of which are **the consumer's income and the prices of the goods and services** that the consumer wishes to consume.
- The consumer's effort to maximize total utility, subject to these constraints, is referred to as the **consumer's problem**.
- The solution to the consumer's problem, which entails decisions about how much the consumer will consume of a number of goods and services, is referred to as **consumer equilibrium**.

# Consumer Equilibrium

- Consider the simple case of a consumer who cares about consuming only two goods: good 1 and good 2. This consumer knows the prices of goods 1 and 2 and has a fixed income or budget that can be used to purchase quantities of goods 1 and 2. The consumer will purchase quantities of goods 1 and 2 so as to completely exhaust the budget for such purchases.
- The actual quantities purchased of each good are determined by the condition for consumer equilibrium, which is

$$\frac{\text{marginal utility of good 1}}{\text{price of good 1}} = \frac{\text{marginal utility of good 2}}{\text{price of good 2}} = \dots = \frac{\text{marginal utility of good } N}{\text{price of good } N}$$

- This condition states that the **marginal utility per dollar spent on good 1 must equal the marginal utility per dollar spent on good 2.**
- The amount purchased of goods 1 and 2 will depend not only on the marginal utilities per dollar spent, but also on the **consumer's budget.**

# Consumer Equilibrium

## ILLUSTRATION:

TABLE 1 Illustration of Consumer Equilibrium. Price of good 1 = \$2, Price of good 2 = \$1, Budget = \$5

Units of good 1	<i>MU</i> of good 1	<i>MU</i> /price of good 1	Units of good 2	<i>MU</i> of good 2	<i>MU</i> /price of good 2
1	24	12	1	9	9
2	18	9	2	8	8
3	12	6	3	5	5
4	6	3	4	1	1

- A consumer's objective is to **maximize his Total utility**, so he always prefers a product which has maximum *MU*/price of good.
- The marginal utility per dollar spent on the first unit of good 1 is greater than the marginal utility per dollar spent on the first unit of good 2 (12 utils > 9 utils). Because the price of good 1 is \$2 per unit, the consumer can afford to purchase this first unit of good 1, and so she does. She now has  $\$5 - \$2 = \$3$  remaining in her budget.

# Consumer Equilibrium

## ILLUSTRATION:

TABLE 1 Illustration of Consumer Equilibrium. Price of good 1 = \$2, Price of good 2 = \$1, Budget = \$5

Units of good 1	MU of good 1	MU/price of good 1	Units of good 2	MU of good 2	MU/price of good 2
1	24	12	1	9	9
2	18	9	2	8	8
3	12	6	3	5	5
4	6	3	4	1	1

- The consumer's next step is to **compare** the **MU per dollar spent on the second unit of good 1 with MU per dollar spent on the first unit of good 2**. Because these ratios are both equal to 9 utils, the consumer **is indifferent** between purchasing the second unit of good 1 and first unit of good 2, so she purchases both.
- She can afford to do so because the second unit of good 1 costs \$2 and the first unit of good 2 costs \$1, for a total of \$3.
- At this point, the consumer has exhausted her budget of \$5 and has **arrived at the consumer equilibrium**, where the marginal utilities per dollar spent are equal.
- The consumer's equilibrium choice is to purchase 2 units of good 1 and 1 unit of good 2.

# Cardinal Utility Approach

**Cardinal:** Expressing something in numbers.

**Cardinal numbers** are counting numbers. The numbers that we use for counting are called cardinal numbers.

**Utility:** Ability to satisfy the wants.

- The ability of goods and services to satisfy consumer wants is the basis for consumer demand.
- Let utility describe the level of satisfaction or benefit that consumers receive from consuming various goods.
- As per cardinal utility approach, **utility** a consumer derives out of a **product is measurable**.

## Basic Assumptions

### 1. Rationality:

He **aims at maximizing his utility** subject to the constraint imposed by his given income.

### 2. Cardinal Utility:

The utility of each commodity is **measurable**.

# Cardinal Utility Approach

## 3. Constant Marginal Utility of Money:

This assumption is necessary if the monetary unit is used as the measure of utility. The essential feature of a standard unit of measurement is that it be constant. If the marginal utility of money changes as income increases (or decreases) the measuring-rod for utility becomes like an elastic ruler, inappropriate for measurement. So it is assumed that the marginal utility of money is constant.

## 4. Diminishing Marginal Utility:

The **utility gained** from successive units of a commodity **diminishes**.

## 5. Total Utility depends on Quantity

The **total utility** of a 'basket of goods' **depends on the quantities of the individual commodities**.

If there are  $n$  commodities in the bundle with quantities  $x_1, x_2, \dots, x_n$ , the total utility is

$$U = f(x_1, x_2, \dots, x_n)$$

With these basic assumptions, the foundation exists for a more detailed examination of the benefits tied to consumption.

# Cardinal Utility Approach

## Equilibrium of the Consumer:

### I. Simple model of a single commodity:

- We begin with the simple model of a single commodity  $x$ . The consumer can either buy  $x$  or retain his money income  $Y$ .
- Under these conditions the consumer is in equilibrium when the **marginal utility of  $x$  is equated to its market price ( $P_x$ )**.
- Symbolically we have

$$\text{MUX} = P_x$$

- If the marginal utility of  $x$  is **greater than** its price, the consumer can increase his welfare by **purchasing more** units of  $x$ .
- Similarly if the marginal utility of  $x$  is **less than** its price the consumer can increase his total satisfaction by **cutting down the quantity** of  $x$  and keeping more of his income unspent.
- Therefore, he attains the maximization of his utility when

$$\text{MUX} = P_x.$$

# Cardinal Utility Approach

Equilibrium of the Consumer:

II. Model of a Two commodity:

If there are more commodities, the condition for the equilibrium of the consumer is the **equality of the ratios of the marginal utilities of the individual commodities** to their prices.

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = \dots = \frac{MU_n}{P_n}$$

*1 Mathematical derivation of the equilibrium of the consumer*

The utility function is

$$U = f(q_x)$$

where utility is measured in monetary units. If the consumer buys  $q_x$  his expenditure is  $q_x P_x$ . Presumably the consumer seeks to maximise the difference between his utility and his expenditure

The utility derived from spending an additional unit of money must be the same for all commodities. If the consumer derives greater utility from any one commodity, he can increase his welfare by spending more on that commodity and less on the others, until the above equilibrium condition is fulfilled.

# Cardinal Utility Approach

## Derivation of the Demand of the Consumer:

The derivation of demand is based on the axiom of **diminishing marginal utility**.

The marginal utility of commodity  $x$  may be depicted by a line with a negative slope (figure 2.2). Geometrically the marginal utility of  $x$  is the slope of the total utility function  $U = f(q_x)$ . The total utility increases, but at a decreasing rate, up to quantity  $x$ , and then starts declining (figure 2.1).

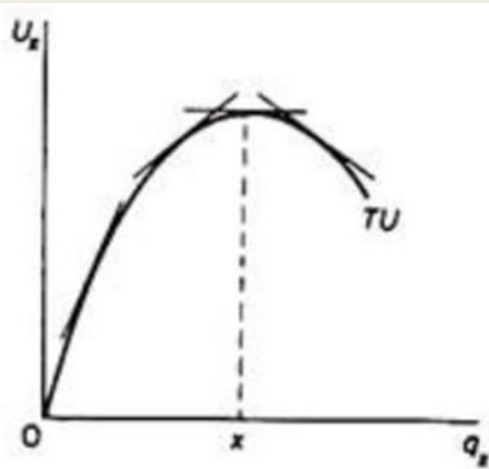


Figure 2.1

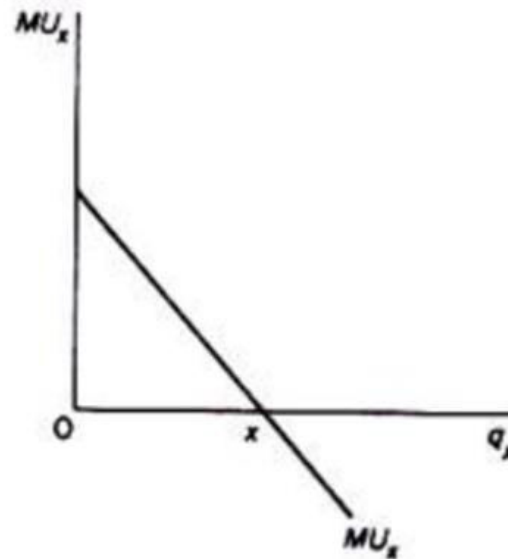


Figure 2.2

# Cardinal Utility Approach

## Derivation of the Demand of the Consumer:

Accordingly the marginal utility of  $x$  declines continuously, and becomes negative beyond quantity  $x$ . If the marginal utility is measured in monetary units the demand curve for  $x$  is identical to the positive segment of the marginal utility curve. At  $x_1$ , the marginal utility is  $MU_1$  (figure 2.3). This is equal to  $P_1$ , by definition. Hence at  $P_1$  the consumer demands  $x_1$  quantity (figure 2.4). Similarly at  $x_2$  the marginal utility is  $MU_2$ , which is equal to  $P_2$ . Hence at  $P_2$  the consumer will buy  $x_2$ , and so on. The negative section of the MU curve does not form part of the demand curve, since negative quantities do not make sense in economics.

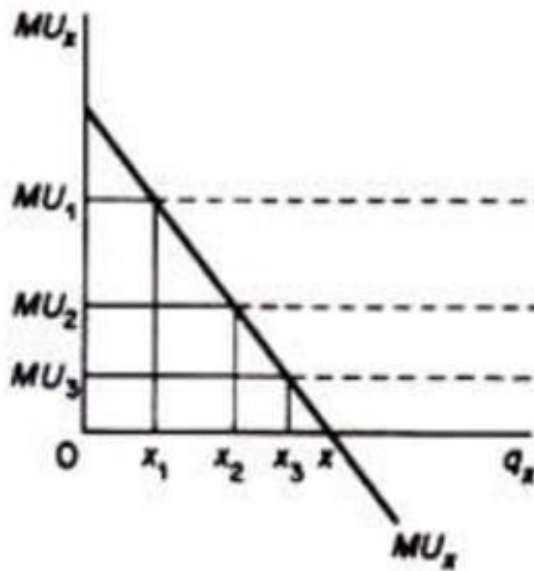


Figure 2.3

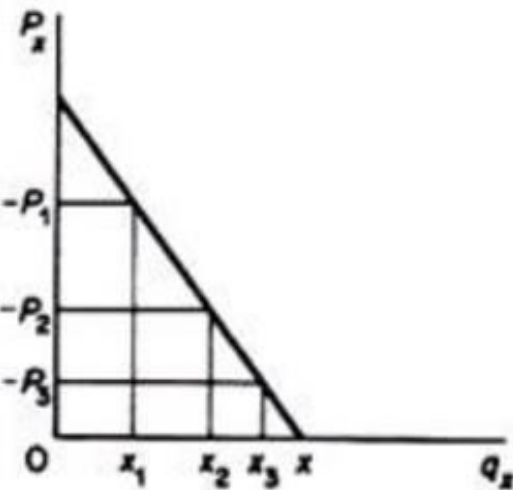
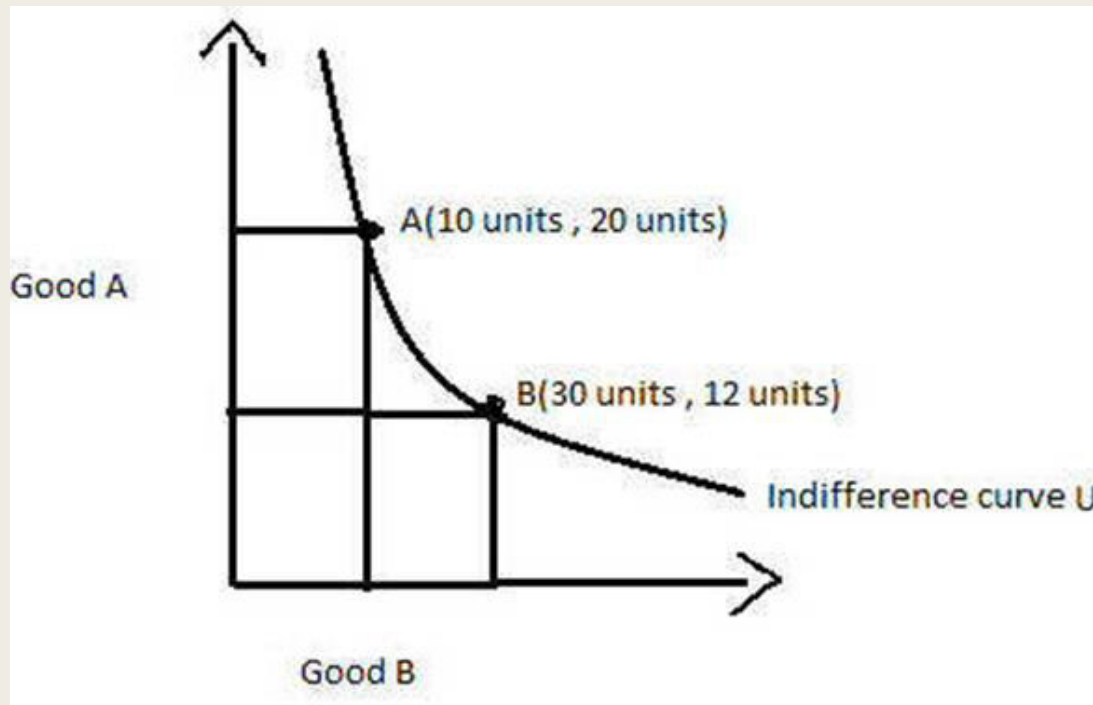


Figure 2.4

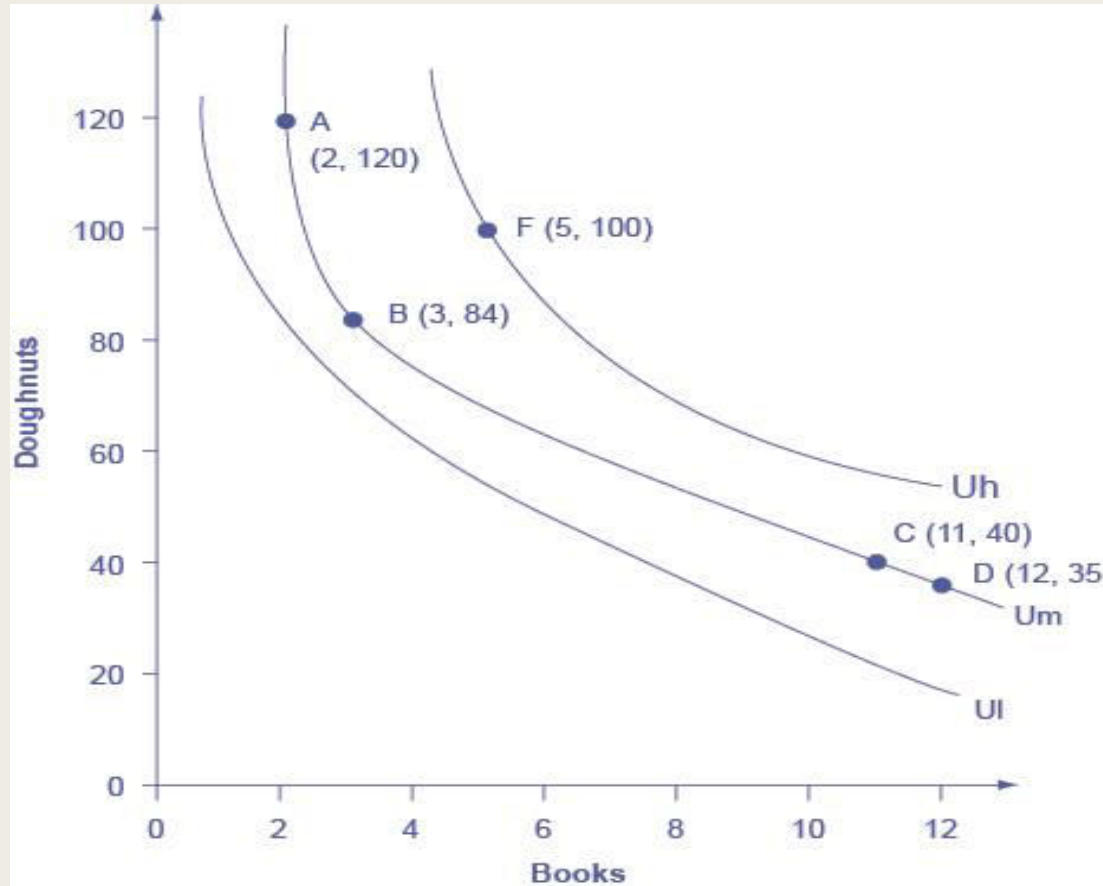
# Indifference curve approach-Ordinal Utility

- An indifference curve is a graph showing combination of two goods that give the consumer equal satisfaction and utility.
- Each point on an indifference curve indicates that a consumer is indifferent between the two and all points give him the same utility.
- The graph shows a combination of two goods that the consumer consumes.



- The consumer will be satisfied at any point along the curve assuming that other things are constant.

# Indifference curve approach



## Shape of an Indifference Curve

Indifference curves have a roughly similar shape in two ways:

- 1) They are downward sloping from left to right;
- 2) They are convex with respect to the origin. In other words, they are steeper on the left and flatter on the right.

# Indifference curve approach

## Shape of an Indifference Curve

1. The downward slope of the indifference curve means that Lilly must trade off less of one good to get more of the other, while holding utility constant.
2. Indifference curves like  $U_m$  are steeper on the left and flatter on the right. The reason behind this shape involves diminishing marginal utility—the notion that as a person consumes more of a good, the marginal utility from each additional unit becomes lower.

# Theory of Revealed Preferences

- **Prof. Samuelson** has invented an alternative approach to the theory of consumer behavior.
- Consumer theory depends on the **existence of preferences** which materialize into utility functions.
- These **utility functions are maximized** by consumers **subject to a budget restraint**.
- The issue is that it is difficult to accept that individuals really have a definite mathematical formula in mind when choosing between different options.
- Revealed Preference Theory (RPT), permits us to find out all we need to know just by **observing his market behavior**, by seeing what he buys at different prices, assuming that his acquisitions and buying experiences do not change his preference patterns or his purchase desires.
- A consumer will **decide to buy some particular combination** of items either because he likes it more than the other combinations that are available to him or because it happens to be cheap.

# Theory of Revealed Preferences

- Let us suppose, we observe that of two collections of goods offered for sale, the consumer chooses to buy A, but not B.
- We are then not in a position to conclude that he prefers A to B, for it is also possible that he buys A, because A is the **cheaper collection**, and he actually would have been happier if he got B. But price information may be able to remove this uncertainty.
- If their price tags tell us that **A is not cheaper than B** (or, B is no-more expensive than A), then there is only one plausible explanation of the consumer's **choice—he bought A because he liked it better**.
- More generally, if a consumer buys some collection of goods, A, rather than any of the alternative collections B, C and D and if it turns out that none of the latter collections is more expensive than A, then we say that **A has been revealed preferred to the combinations B, C and D** or that B, C and D have been revealed inferior to A.

# Theory of Revealed Preferences

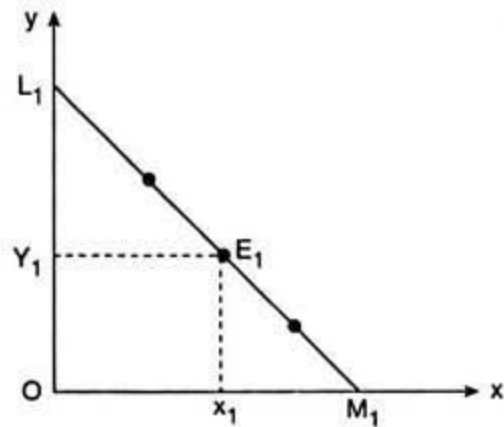


Fig. 6.104 Revealed preference

Therefore, if the consumer buys the combination  $E_1 (x_1, y_1)$  of the goods  $X$  and  $Y$  and does not buy the combination  $E_2(x_2, y_2)$  at the prices  $(p_x^1, p_y^1)$  of the goods, then we would be able to say that he prefers combination  $E_1$  to combination  $E_2$ , if we obtain

$$p_x^1 x_1 + p_y^1 y_1 \geq p_x^1 x_2 + p_y^1 y_2$$

(6.137)

# Theory of Revealed Preferences

- The complete set of combinations of the goods X and Y to which a particular combination is revealed preferred can be found with the aid of the consumer's price line.
- Let us suppose that the consumer's budget line is L1M1 in Fig. 6.104 and he is observed to purchase the combination E1 ( $x_1, y_1$ ) that lies on this line.
- Now, since the **costs of all the combinations that lie on the budget line are the same as that of E1** and since the costs of all the combinations that **lie below** and to the left of the budget line **are lower than that of E1** we may say that **E1 is revealed preferred to all the combinations lying on or below** the consumer's budget line.
- Again, since the costs of the combinations that **lie above** and to the right of the budget line are **higher than that of E1** we cannot say that the consumer prefers E1 to these combinations when he is observed to buy E1, because here **E1 is the cheaper combination.**

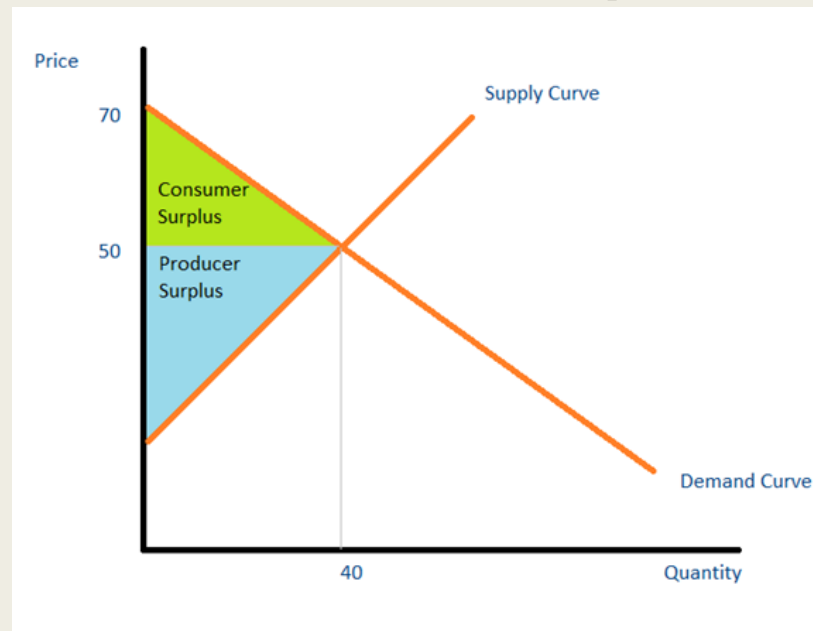
# Theory of Revealed Preferences

- We have to note here the difference between “preference” and “revealed preference”. Combination A is “preferred” to B implies that the consumer ranks A ahead of B.
- But A is **“revealed preferred to B”** means **A is chosen when B is affordable** (no-more-expensive).
- In our model of consumer behaviour, we generally assume that people are choosing the best combination they can afford that the choices they make are preferred to the choices that they could have made.
- That is, if  $(x_1, y_1)$  is directly revealed preferred to  $(x_2, y_2)$ , then  $(x_1, y_1)$  is, in fact, preferred to  $(x_2, y_2)$ .
- Let us suppose, the consumer is buying the combination  $(x_1, y_1)$  at the price set  $(p'_x, P'_y)$  let us also suppose that another combination is  $(x_2, y_2)$ , such that  $p'_x x_1 + p'_y y_1 \geq p'_x x_2 + p'_y y_2$ . Now, if the consumer buys the most preferred combination subject to his budget constraint, then we will say the combination  $(x_1, y_1)$  is strictly preferred to combination  $(x_2, y_2)$ .

# Consumer Surplus:

- Consumer surplus, also known as **buyer's surplus**, is the **economic measure of a customer's excess benefit**. It is calculated by analyzing the **difference between the consumer's willingness to pay for a product and the actual price they pay**, also known as the **equilibrium price**.
- A **surplus occurs** when the **consumer's willingness to pay** for a product **is greater than its market price**.
- Consumer surplus is based on the economic theory of marginal utility, which is the additional satisfaction a person derives by consuming one more unit of a product or service.
- The satisfaction varies by consumer, due to differences in personal preferences.
- According to the theory, the more of a product a consumer buys, the less willing he/she is to pay more for each additional unit due to the diminishing marginal utility derived from the product.

# Consumer Surplus:



- The point where the **demand and supply meet** is the **equilibrium price**.
- The **area above the supply level and below the equilibrium price** is called **product surplus (PS)**, and the **area below the demand level and above the equilibrium price** is the **consumer surplus (CS)**.
- While taking into consideration the demand and supply curves, the formula for consumer surplus is  $CS = \frac{1}{2} (\text{base}) (\text{height})$ . In our example,  $CS = \frac{1}{2} (40) (70 - 50) = 400$ .

# Consumer Surplus:

- **Consumer surplus** generally **declines** with consumption.
- One explanation for this is the **law of diminishing marginal utility**, which suggests that the first unit of a good or service consumed generates much greater utility than the second, which generates greater utility than the third and subsequent units.
- A very thirsty consumer will be prepared to pay a relatively high price for their first soft drink, but, as they drink more, less utility is derived and the price they would be prepared to pay falls.
- Therefore, in the above diagram, as consumption rises from zero, at C, to Q, marginal utility falls.
- As utility falls, the price that consumers are prepared to pay declines, causing the demand curve to slope down from A to B.
- Some firms can capture this consumer surplus by charging the highest price that consumers would be prepared to pay, rather than charge price P for all units consumed.



**MODULE 3 : THEORY OF PRODUCTION  
AND ANALYSIS OF COST**

**JAGADEESH BABU MK**

# Theory of Production



- Production is a process that **create/adds value** or **utility**
- It is the process in which the **inputs** are converted in to **outputs**.

Inputs

- The factors of production such as Land, Labour, Capital, Technology ,etc

Outputs

- The goods and service produced such as Soap, Omni Car ,etc

# Theory of Production



- Explain the **principles** by which a business firm decides
  - how much of each commodity that it will **sell or produce** (its “outputs” or “products”) and
  - how much of each kind of **labour, raw material, fixed capital good, etc.**, that it employs (its “inputs” or “factors of production”) in the process of production.

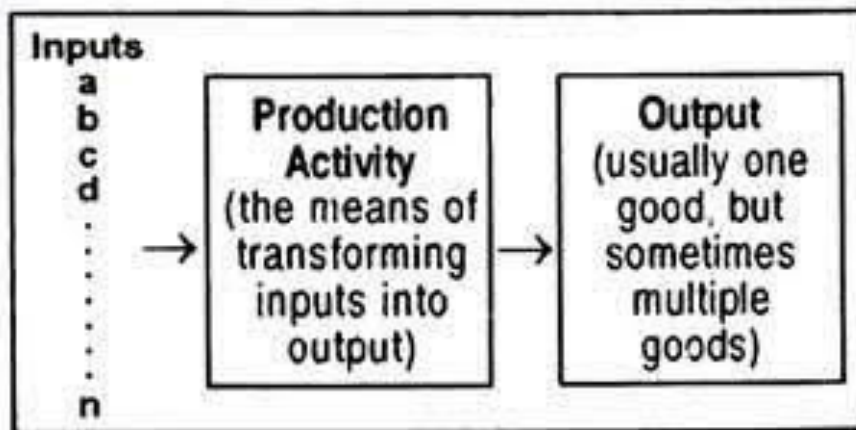
## Factors of Production

Land	<ul style="list-style-type: none"><li>• Natural resources such as surface, mineral, air, rivers, sea, etc</li><li>• Free gift of nature, fixed</li></ul>
Labour	<ul style="list-style-type: none"><li>• Mental or physical effort done by a man with the view of</li></ul>
Capital	<ul style="list-style-type: none"><li>• Man made goods used in the production process</li><li>• Most mobile factor</li></ul>
Organization	<ul style="list-style-type: none"><li>• Entrepreneur or coordinator of all other factors of production</li></ul>

# Theory of Production



- Theory of production include the
  - the **quantities of these commodities produced** and productive factors **used**.
  - **relationship between the prices of commodities and the prices (or wages or rents) of the productive factors** used to produce them.



## Factor of Production

Land  
Labor  
Capital  
Entrepreneurship

## Price

Rent  
Wage  
Interest  
Profits

# Theory of Production



- Various production related **decisions** that an enterprise makes can be classified into **three layers**.
- The **first layer** includes
  - **decisions** about **methods of producing** a given quantity of the output in a plant of given size and equipment, **at least cost**.
  - It involves the problem of what is called **short-run cost minimization**.
- The **second layer** including,
  - the **determination** of the **most profitable quantities** of products to produce in any given plant, deals with **short-run profit maximization**.
- The **third layer** concerning,
  - the **determination** of the **most profitable size and equipment of plant**, relates to **long-run profit maximization**.





## Total Product (TP)

- Total quantity of output produce with a given quantity of input.
- $\text{Total Product} = \text{Average Product} \times \text{Total Variable Input}$

## Average Product (AP)

- Ratio of total production to total variable inputs (labour) used to produce a product.
- $\text{Average Product} = \text{Total Product} / \text{Total Variable Input}$

## Marginal Product (MP)

- The change in total production when variable inputs are increased in increments of one unit.
- $\text{Marginal product} = \text{change in TP} / \text{change in Total Variable Input}$

# Law of Variable Proportions:



- Law of Variable Proportions is also known as **Law of Proportionality**.

## Statement of law

Law of Variable Proportions states that as we increase quantity of only one input keeping other inputs fixed, total product (TP) initially increases at an increasing rate, then at a decreasing rate and finally at a negative rate.

LVP is also known as 'Law of Returns' or 'Returns to Variable factor'.

# Law of Variable Proportions:



- In the **short run**, when **output of a commodity** is sought to be **increased**, the law of variable proportions comes into operation.
- Short run means a period where one or more variables are fixed and one factor is variable.
- For instance, there are **two factors of production** viz., land and labour. **Land** is a **fixed factor** whereas **labour** is a **variable factor**.
- law of variable proportions explains the impact of variable factor on output, when all other factor of production are variable.

# Law of Variable Proportions:



- Now, suppose we have a **land** measuring **5 hectares**.
- We **grow wheat** on it with the **help of variable factor** i.e., labour.
- Accordingly, the proportion between **land and labour** will be **1: 5**.
- If the **number of labourers** is **increased to 2**, the new proportion between labour and land will be **2: 5**.
- Due to **change in the proportion of factors** there will also emerge a **change in total output at different rates**.
- This tendency in the theory of production called the **Law of Variable Proportion**.

Here in this example, what we are witnessing is changes in proportion of fixed factor and variable factor (**1:5 to 2:5**), leading to increase in output.

# Law of Variable Proportions:



## Assumptions:

### (i) Constant Technology:

- The state of technology is assumed to be given and constant. If there is an improvement in technology the production function will move upward.

### (ii) Factor Proportions are Variable:

- The law assumes that factor proportions are variable. If factors of production are to be combined in a fixed proportion, the law has no validity.

### (iii) Homogeneous Factor Units:

- The units of variable factor are homogeneous. Each unit is **identical in quality and amount with every other unit.**

### (iv) Short-Run:

- The law operates in the short-run when it is not possible to vary all factor inputs.

# Law of Variable Proportions:



## Explanation of the Law:

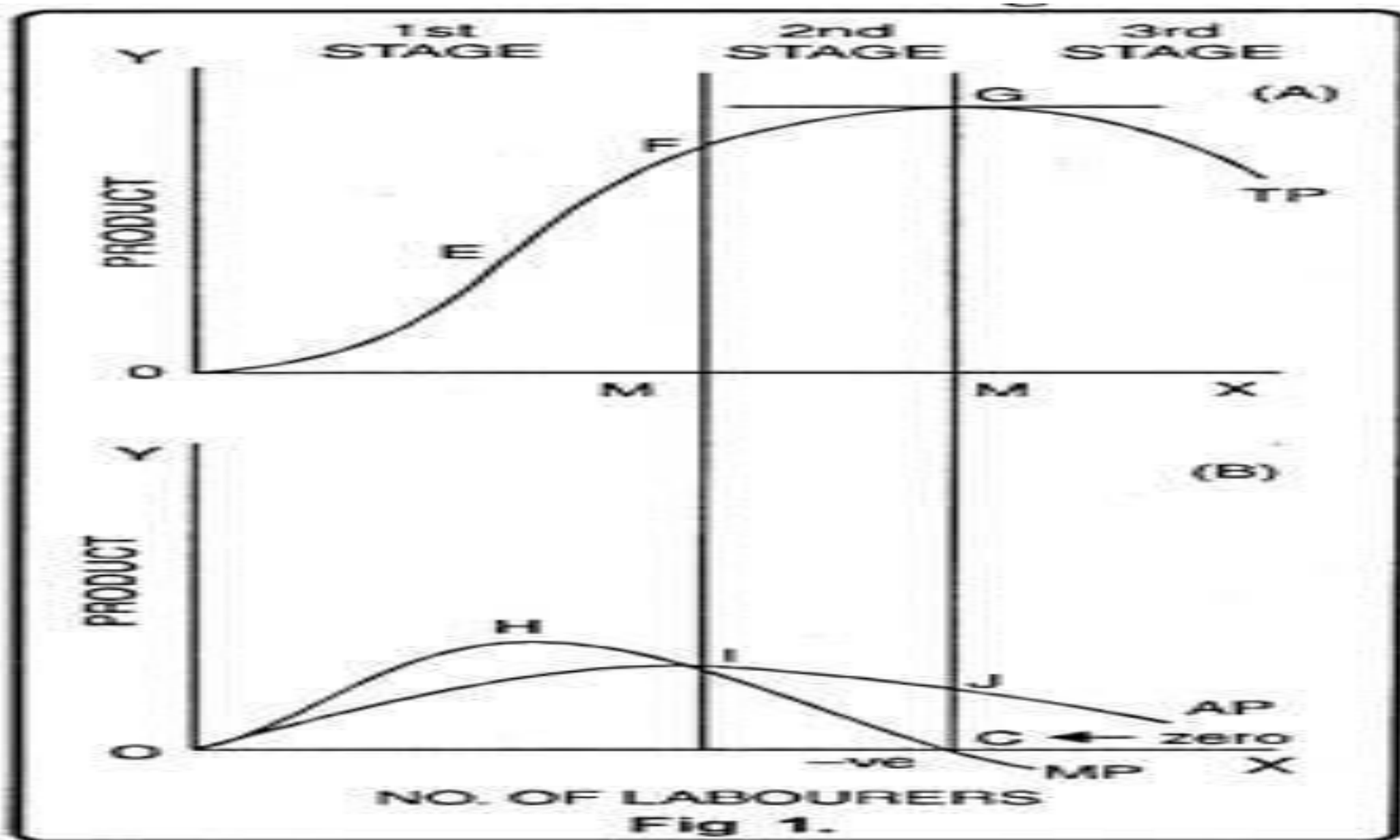
- In order to understand the law of variable proportions we take the example of agriculture.

Table 1.

Units of Land	Units of Labour	Total Production	Average Production	Marginal Production
10 Acres	0	—	—	—
"	1	20	20	20
"	2	50	25	30
"	3	90	30	40
"	4	120	30	30
"	5	140	28	20
"	6	150	25	10
"	7	150	21.3	0
"	8	140	17.5	-10

} 1st stage  
 } MP > AP  
 } AP = MP  
 } 2nd stage  
 } MP = 0 and TP Maximum  
 } 3rd stage MP < 0

# Law of Variable Proportions:



# Law of Variable Proportions:



## Graphic Presentation:

- In fig. 1, on OX axis-number of laborers, OY axis -quantity of product. TP is total product curve. Up to **point 'E'**, TP is **increasing at increasing rate**. **Between points E and G** it is **increasing at the decreasing rate**.
- Up to point 'H' marginal product increases. At point 'H', i.e., when 3 units of labourers are employed, it is maximum. After that **marginal product(MP)** starts **falling** reaching **zero at C** and then **negative**.
- AP curve represents average product. Before point 'I', **AP** is **less than MP**. At **point 'I'** **AP** is **maximum**. **Up to point I, AP** increases but after that it starts to **diminish**.

# Law of Variable Proportions:



Total Product	Marginal Product	Average Product
<b>Stage I</b> First increases at increasing rate then at diminishing rate.	Increases in the beginning then reaches a maximum and begins to decrease.	First increases, continues to increase and becomes maximum.
<b>Stage II</b> Continues to increase at diminishing rate and becomes maximum.	Continues to diminish and becomes equal to zero.	Becomes equal to MP and then begins to diminish.
<b>Stage III</b> Diminishes	Becomes negative.	Continues to diminish but will always be greater than zero.

- **Stage I** – AP is **increasing**, so that TP must also be **increasing**. This means that the efficiency of the variable factor of production is increasing. The efficiency of b, the fixed factor, is also increasing.
- **Stage II**- **decreasing AP and a decreasing MP**, but with **MP not negative**. Thus, the **efficiency of the variable factor is falling**, while the **efficiency of b, the fixed factor, is increasing**, since the TP with b1 continues to increase.
- **Stage III** - **falling AP and MP**, and **further by negative MP**. Thus, the **efficiency of both the fixed and variable factor is decreasing**.

# Law of Variable Proportions:



## Rational Decision:

- Production **will not take place** in either **stage III and stage I**. Thus, a rational producer will operate in stage II. This is because, at **stage 1 each variable input is increasingly more productive**, firms employ as many as they can, as quickly as they can. **Stage III**, with **negative marginal returns**, is not particularly attractive to firms.
- Suppose **b were a free resource**; i.e., it commanded no price. An entrepreneur would want to **achieve the greatest efficiency possible from the factor for which he is paying**, i.e., from **factor a**. Thus, he would want to produce where **AP is maximum**, boundary **between stage I and II**.
- Other hand, **a were the free resource**, then he would want to **employ b to its most efficient point**; boundary **between stage II and III**.
- **Both resources commanded a price**, he would **produce somewhere in stage II**. At what place in this stage production takes place would depend upon the relative prices of a and b.

# Law of Returns to Scale:



- The law of returns is different from the law of returns to scale.
- The **law of returns** operates in the **short period**. It explains the production behaviour of the firm with **one factor variable while other factors are kept constant**.
- Whereas the **law of returns to scale** operates in the **long period**. It explains the production behaviour of the firm with **all variable factors**.
- The **law of returns to scale** describes the **relationship between variable inputs and output** when all the inputs, or factors are **increased** in the **same proportion**.
- Here we find out in **what proportions the output changes** when there is **proportionate change in the quantities of all inputs**.
- The answer to this question helps a firm to determine **its scale or size in the long run**.



## Table: Law of returns to scale

Factor combination	Scale of inputs (labour & capital in units)	TP (in quintals)	MP (in quintals)
IRS	2+1	20	20
	4+2	50	30
	6+3	90	40
CRS	8+4	140	50
	10+5	190	50
	12+6	240	50
	14+7	290	50
DRS	16+8	320	30
	18+9	340	20
	20+10	350	10

# Law of Returns to Scale:



- These three laws of returns to scale:

## (1) Increasing Returns to Scale:

If the **output** of a firm **increases more than** in proportion to an **equal percentage increase in all inputs**, the production is said to exhibit increasing returns to scale.

For example, if the amount of **inputs are doubled** and the **output increases by more than double**, it is said to be an increasing returns to scale.

When there is an **increase in the scale of production**, it leads to **lower average cost per unit** produced as the firm enjoys economies of scale.

## (2) Constant Returns to Scale:

- When all **inputs are increased by a certain percentage**, the output increases **by the same percentage**.
- For example, if a firm **doubles inputs**, it **doubles output**.
- The constant scale of production has **no effect on average cost per unit produced**.

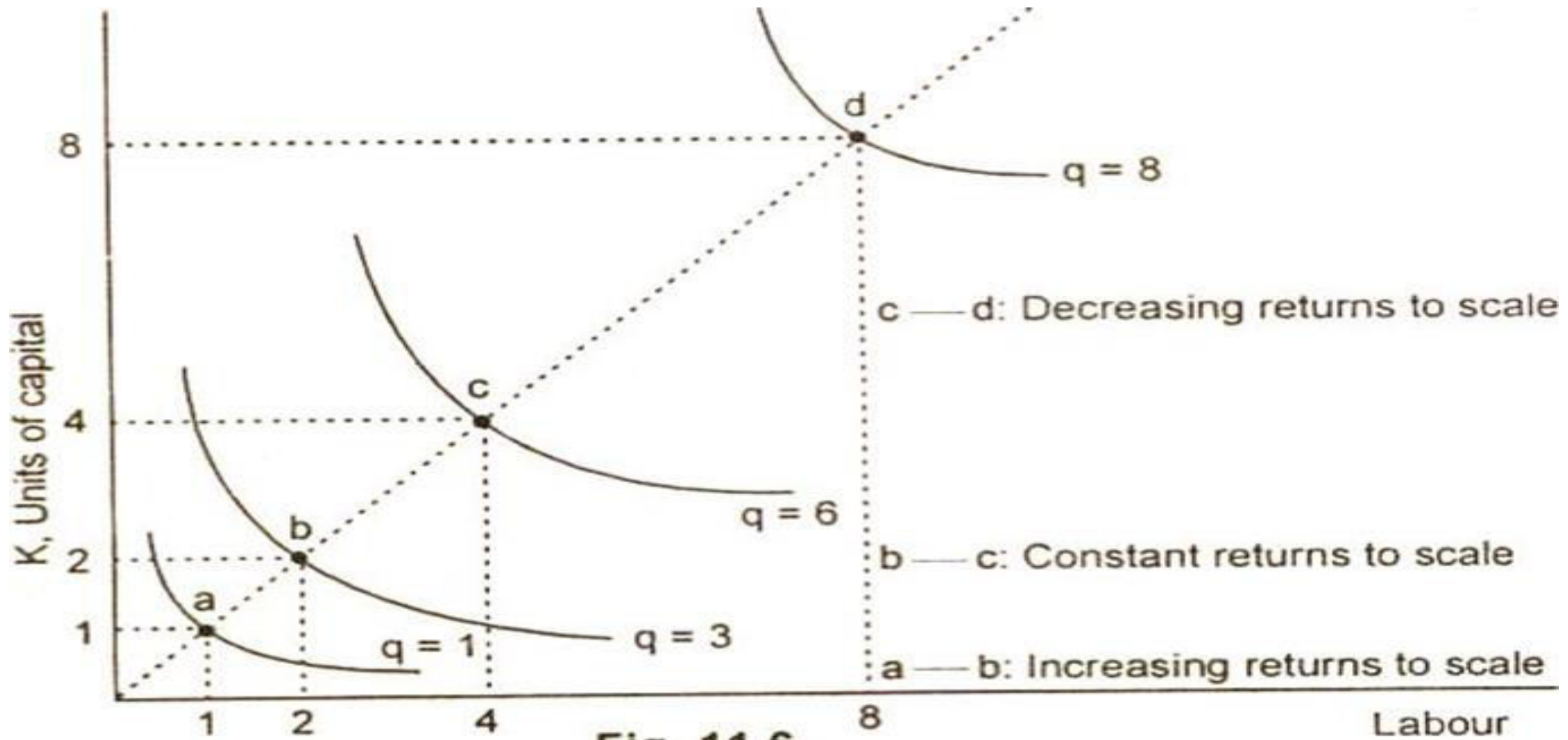
# Law of Returns to Scale:



## (3) Diminishing Returns to Scale:

- The term 'diminishing' returns to scale refers to scale where **output increases in a smaller proportion than the increase in all inputs.**
- If a firm **increases inputs by 100%** but the **output decreases by less than 100%**, the firm is said to exhibit decreasing returns to scale.
- In case of decreasing returns to scale, the firm faces **diseconomies of scale.**
- The firm's scale of production leads to **higher average cost per unit produced.**

# Law of Returns to Scale:



# ECONOMIES OF SCALE



- Economies of scale refer to the **cost advantage experienced** by a firm when it **increases its level of output.**



- The advantage arises due to the inverse relationship between per-unit fixed cost and the quantity produced.

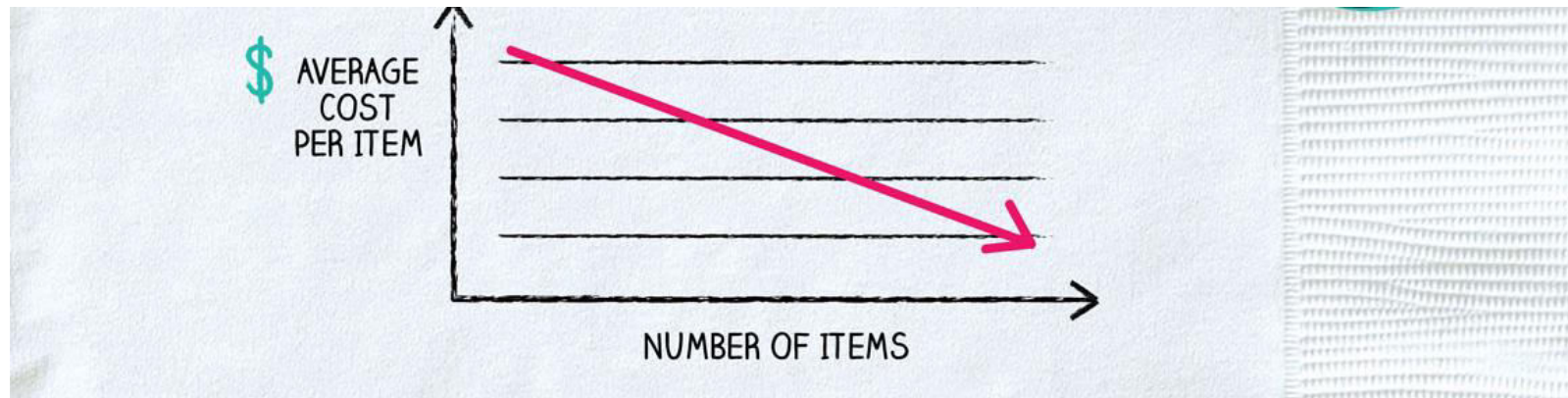
# Economies of scale



- The **greater** the quantity of output produced, the **lower the per-unit fixed cost**.
- Economies of scale also result in a **fall in average variable costs** (average non-fixed costs) with an increase in output.
- This is brought about by **operational efficiencies and synergies** as a result of an **increase in the scale of production**.

## Effects of Economies of Scale on Production Costs

1. It **reduces the per-unit fixed cost**. As a result of increased production, the fixed cost gets spread over more output than before.
2. It **reduces per-unit variable costs**. This occurs as the expanded scale of production increases the efficiency of the production process.



# Economies of scale



## Types of Economies of Scale



### 1. Internal Economies of Scale

- This refers to economies that are **unique to a firm**.
- For instance, a firm may hold a **patent** over a **mass production machine**, which allows it to **lower its average cost of production** more than other firms in the industry.

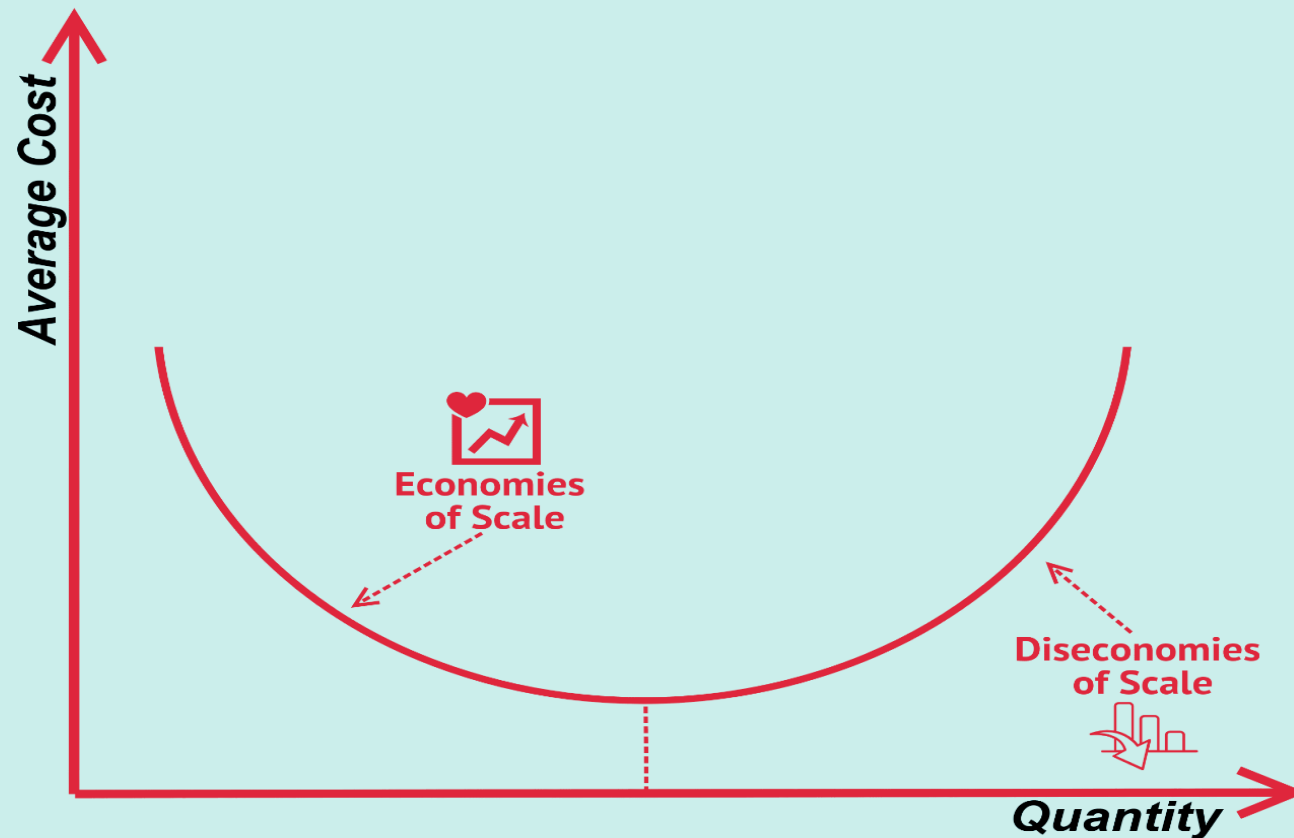
### 2. External Economies of Scale

- These refer to economies of scale enjoyed by an **entire industry**.
- For instance, suppose the government wants to **increase steel production**. In order to do so, the government announces that **all steel producers who employ more than 10,000 workers** will be given a **20% tax break**. Thus, firms employing less than 10,000 workers can potentially lower their **average cost of production** by employing more workers. This is an example of an external economy of scale – one that affects an entire industry or sector of the economy.



# Diseconomies Of Scale In A Nutshell

In Economics, Diseconomies of Scale happens when a company has grown so large that its costs per unit will start to increase. Thus, losing the benefits of scale. That might happen for several reasons, such as coordination and management costs and communication inefficiencies as the company becomes too big.



# Isoquant and Iso-cost Line



The firm's cost, depends on **two key factors**, viz.:

(1) **The technical relation** between **inputs and output** (i.e., how outputs vary as inputs vary), and

(2) **Factor prices** (i.e., the price of labour or the wages, the price of capital or the interest rate and so on).

## ISOQUANT:

- The **long-run production function** of a firm involving the **usage of two factors**, say, capital and labour is represented by **equal-product curve or isoquant**. This curve is also known as a **producer's indifference curve**.
- An **isoquant traces out** the **combinations of any** two inputs **which yield the** same level of output.
- This combinations must be the **most efficient ones** — i.e., any point on an **isoquant shows** the **minimum quantities of the inputs required to produce a given output**.
- Isoquants are typically drawn as being convex to the origin because of the assumed substitutability of inputs.

# Isoquant and Iso-cost Line



## Isoquants:

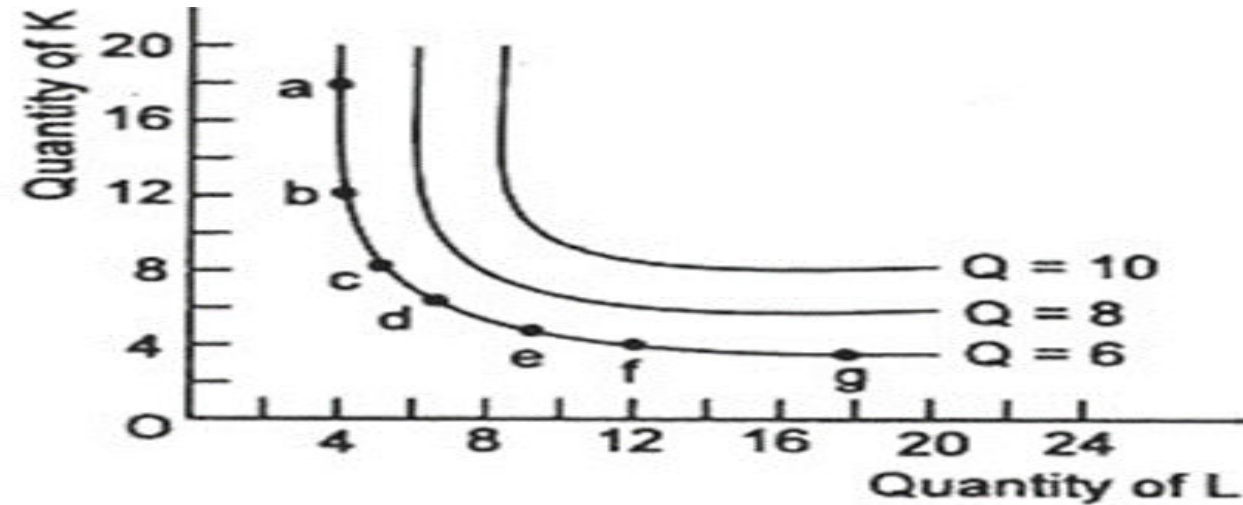
- An isoquant is a locus of points showing all the **technically efficient** ways of **combining factors of production** to produce a **fixed level of output**.
- It is also known as the **equal product curve**.
- In case of two variable factors, labour and capital, an isoquant appears as a curve on a graph the axes of which measure quantities of the two factors.

Method	Units of K	Units of L
<i>a</i>	18	2
<i>b</i>	12	3
<i>c</i>	9	4
<i>d</i>	6	6
<i>e</i>	4	9
<i>f</i>	3	12
<i>g</i>	2	18

# Isoquant and Iso-cost Line



- Table 1 illustrates, by using hypothetical numbers, seven alternative methods of producing six units of output.
- These alternatives are shown also in Fig. 5, as represented by the curve  $Q = 6$ .
- Thus, the firm could choose combination a ( $18K + 2L$ ), combination g ( $2K + 18L$ ) or any other combination shown in Table 1.



- Fig. 5 shows two other isoquants, each corresponding to particular (fixed) level of output, viz.,  $Q = 8$  and  $Q = 10$ .
- Each curve shows the alternative combinations of labour and capital that would produce 8 and 10 units of output, respectively. We could draw as many isoquants as we like.

# Isoquant and Iso-cost Line

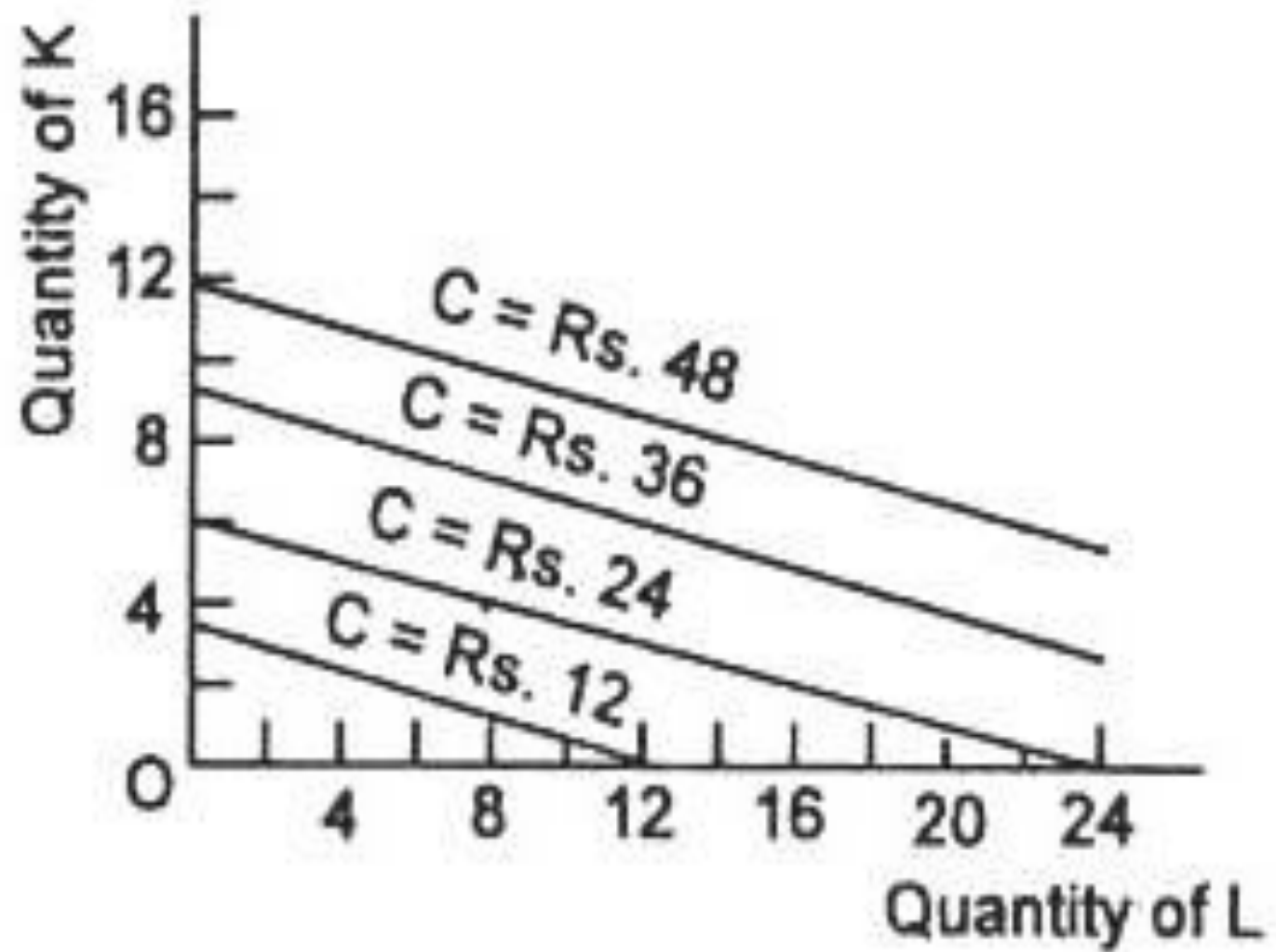


## Iso-cost Lines:

- An isoquant **shows what a firm is desirous of producing**. But, the desire to produce a commodity is not enough.
- The producer must have **sufficient capacity to buy** necessary factor inputs to be able to reach its desired production level.
- The **capacity of the producer** is shown by his **monetary resources, i.e., his cost outlay** (or how much money he is capable of spending) on capital and labour, the prices of which are taken as constant, i.e., given in the market place. So, like the consumer the producer has also to operate under a **budget (resource) constraint**.
- This is picturized by his budget line called **iso-cost line**.
- An **isocost curve** is a curve showing the **combinations of factor inputs that have constant market cost**. If firms are acting as price-takers in factor markets, the isocost curve is a straight line, whose slope represents the relative prices of different factors' services.



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# Isoquant and Iso-cost Line



Isocost lines  $C = \text{Rs. } 12$ ,  $C = \text{Rs. } 24$  and  $C = \text{Rs. } 48$  show the alternative combinations of capital and labour that can be purchased or hired by spending Rs. 12, Rs. 24 and Rs. 48, respectively.

- These lines are **straight lines** because **factor prices are constant** and they have a **negative slope equal to the factor-price ratio**, i.e., the ratio of labour price to capital price (i.e., the wage ratio -5- the rate of interest).

# Optimum combination of inputs



- In the **long run**, all factors of production can be **varied**.
- The **profit maximization firm** will choose the **least cost combination of factors to produce** at any given level of output.
- The **least cost combination** or the **optimum factor combination** refers to the **combination of factors** with which a firm can produce a **specific quantity of output at the lowest possible cost**.

## **Explanation:**

There are two methods of explaining the optimum combination of factor:

- (i) **The marginal product approach.**
- (ii) **The isoquant / isocost approach.**

# Optimum combination of inputs



## (i) The Marginal Product Approach:

- In the **long run**, a firm who focus on **profit maximization** will obviously want to use that mix of factor combination which is **least costly**.

- In search of **high** than the other

- When the **last** firm is maximiz

- The least cost when:

$$\frac{Mpp_a}{P_a} = \frac{Mpp_b}{P_b} = \frac{Mpp_c}{P_c} = \frac{Mpp_n}{P_n} \quad \text{ie}$$

$$\frac{10}{50} = \frac{10}{30} = \frac{10}{60} \qquad \frac{18}{4.35} = \frac{7}{4.35} = \frac{13}{4.35}$$

$$12.5 = 3.75 = 6.67 \qquad 4.35 = 4.35 = 4.35$$

Where, a, b, c, n - different factors of production.

Mpp is the marginal physical product.

A firm will **reduce its cost** by using **more** of those factors with a **high Mpp / P** ratios and **less** of those with a **low Mpp / P** ratio until they all become equal.



<b>Labor</b>	<b>Total Product</b>	<b>Marginal Physical Product</b>	<b>Marginal Revenue Product</b>
0	0		
1	20	20	40
2	50	30	60
3	75	25	50
4	95	20	40
5	110	15	30
6	120	10	20
7	125	5	10
8	125	0	0

# Optimum combination of inputs



- **(ii) The Isoquant / Isocost Approach:**
- The **least cost combination of factors or producer's equilibrium** is now explained with the help of iso-product curves and iso-costs.
- The optimum factors combination or the least cost combination refers to the combination of factors with which a firm can produce a **specific quantity of output at the lowest possible cost**.
- As we know, there are a number of combinations of factors which can yield a given level of output. The producer has to choose, one **combination** out of these **which yields a given level of output** with **least possible outlay**.
- The **least cost combination of factors** for any level of output is that where the **iso-product curve is tangent to an iso-cost curve**.

# Optimum combination of inputs



The analysis of producers' equilibrium is based on the following assumptions:

- (a) There are **two factors** X and Y in the combinations.
- (b) All the units of factor X are **homogeneous** and so is the case with units of factor Y.
- (c) The **prices of factors** X and Y **are given and constants**.
- (d) The **total money outlay** is also given.
- (e) In the factor market, it is the **perfect completion** which prevails.

Under the conditions assumed above, the producer is in equilibrium, when the following two conditions are fulfilled.

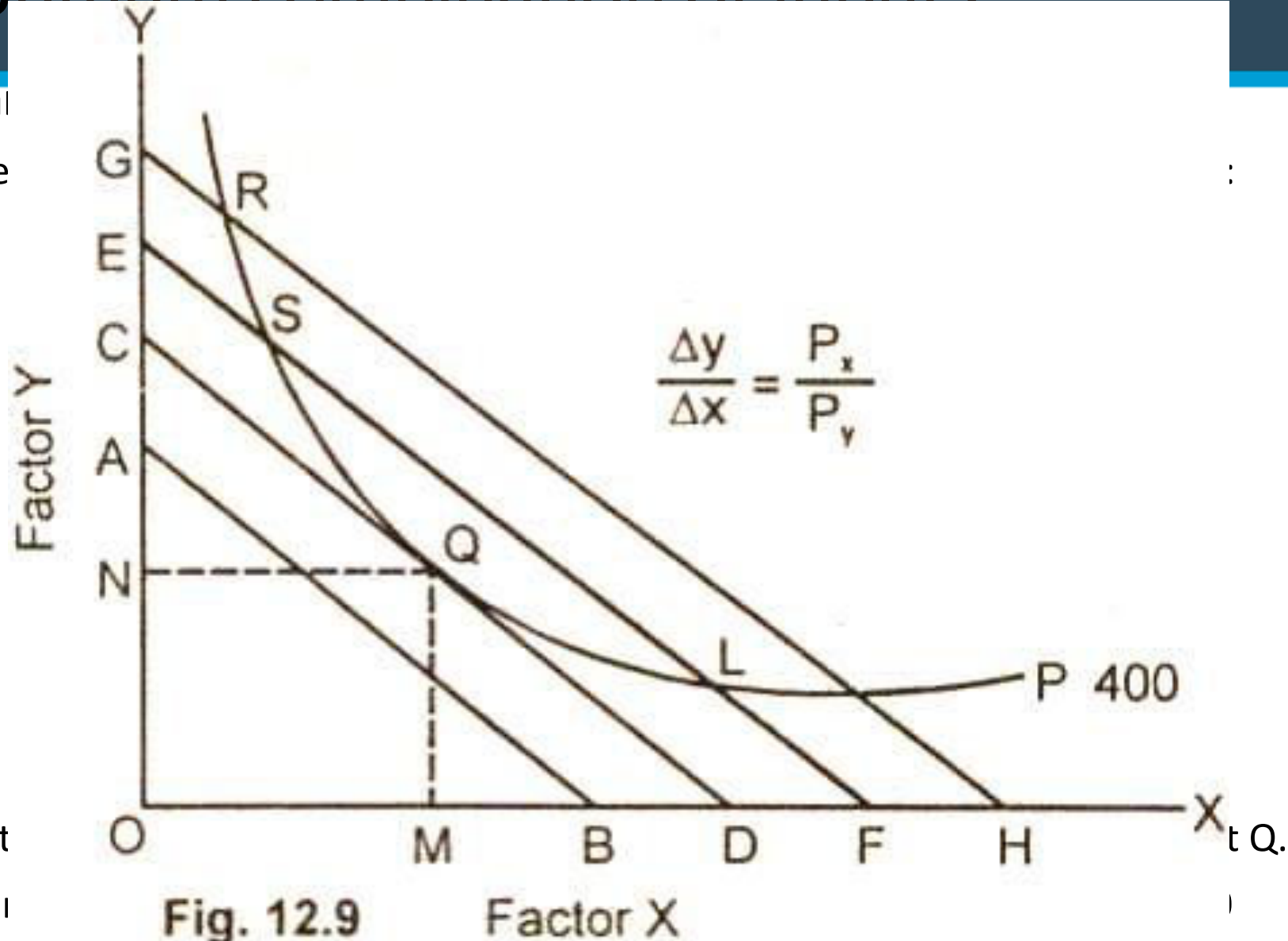
- (1) The isoquant must be convex at the origin.
- (2) The slope of the Isoquant must be equal to the slope of iso-cost line.

# Optimum combination of inputs



## Diagram

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- The fir  
units of output.
- This is the **optimum output** which the firm can get from the cost outlay of Q.

# Optimum combination of inputs



- In this figure any point below Q on the price line AB is desirable as it shows lower cost, but it is not attainable for producing 400 units of output. As regards points RS above Q on iso-cost lines GH, EF, they show higher cost.
- These are beyond the reach of the producer with CD outlay. Hence point **Q is the least cost point**.
- It is the point which is the least cost factor combination for producing 400 units of output with OC units of factor Y and OD units of factor X.
- Point Q is the **equilibrium of the producer**.
- At this point, the slope of the isoquants equal to the slope of the isocost line. The MRT of the two inputs equals their price ratio.

Thus we find that at point Q, the two conditions of producer's equilibrium in the choice of factor combinations, are satisfied.

(1) The isoquant (IP) is convex at the origin.

(2) At point Q, the slope of the isoquant  $\Delta Y / \Delta X$  (M<sub>TYSxy</sub>) is equal to the slope of the iso-cost in  $P_x / P_y$ .

The producer gets the optimum output at least cost factor combination at Q.

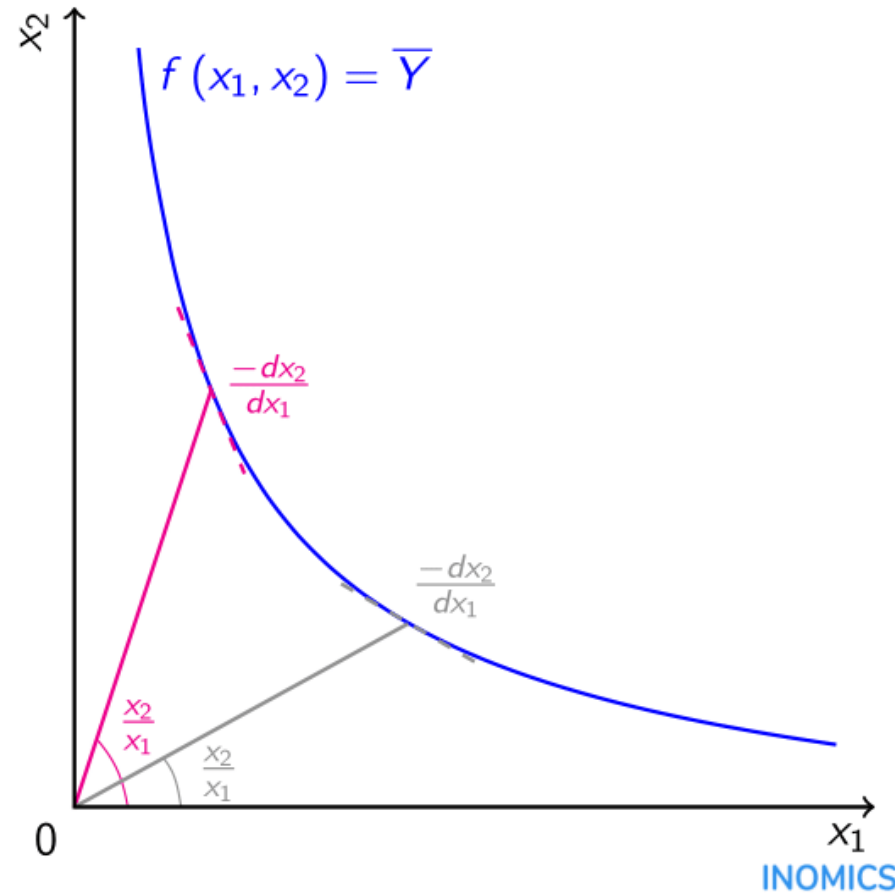
# Elasticity of substitutions



- Elasticity of substitution is the **elasticity of the ratio of two inputs to a production (or utility) function with respect to the ratio of their marginal products (or utilities)**.
- In a competitive market, it measures the **percentage change in the two inputs used in response to a percentage change in their prices**.
- Elasticity of substitution measures the **ease with which one can switch between factors of production**.
- It gives a measure of the **curvature of an isoquant**, and thus, the **substitutability between inputs** (or goods), i.e. how easy it is to substitute one input (or good) for the other.
- In order to **calculate** an elasticity of substitution it is first necessary to **determine an isoquant and work out input ratios and marginal rates of technical substitution** along the isoquant.

# Elasticity of substitutions

- An **isoquant** is a curve that shows the combinations of inputs  $x_1$  and  $x_2$  that produce a given level of output  $\bar{Y}$ . The isoquant is defined by the equation  $f(x_1, x_2) = \bar{Y}$ .



Find  $x_2$  required to produce a given level of output  $\bar{Y}$  using the blue isoquant



- For any given point  $(x_1, x_2)$  on the isoquant  $f(x_1, x_2) = \bar{y}$ , **input ratio** is the **quantity of one input divided by the other  $x_2/x_1$** .
- For any given point  $(x_1, x_2)$  on the isoquant  $f(x_1, x_2) = \bar{y}$ , the **marginal rate of technical substitution** is  $-dx_2/dx_1$ , which is the **rate at which input  $x_1$  can be exchanged for input  $x_2$**  while maintaining the level of output at  $\bar{y}$ .

# Elasticity of substitutions



- **Elasticity of substitution  $\sigma$**  measures how **easy** it is to **move between points along an isoquant**. When moving between such points there are **changes** in both the **input ratio and the MRTS**.
- Elasticity of substitution is the proportionate changes in the input ratio against proportionate changes in the MRTS.

$$\sigma = \text{Input ratio/MRTS} ; \quad \sigma = \frac{\frac{\Delta(x_2/x_1)}{x_2/x_1}}{\frac{\Delta(-dx_2/dx_1)}{-dx_2/dx_1}} \cdot$$

- A **positive value of  $\sigma$**  indicates a certain **degree of substitutability between production inputs**.
- For the extreme case of **perfect substitutes**, elasticity of substitution approaches **infinity  $\sigma \rightarrow \infty$** . Electricity from two different suppliers could be seen as an example of a perfect substitute: the electricity does the same job of powering production, regardless of the supplier.

# Elasticity of substitutions



- On the other hand, a value of  $\sigma=0$  indicates just the opposite: the **inputs cannot substitute** for each other, indeed they are **perfect complements**; one cannot be employed without also employing the other. For example, in car production, wheels require tyres; neither is sufficient on its own. Thus wheels and tyres are perfect complements.
- The decision about **how to organise production** depends both on the **substitutability of production inputs** (value of  $\sigma$ , shape of isoquants) and on the **relative cost of the inputs to one another**, which can be represented by means of isocost lines.
- For example, if an energy firm produces electricity both through an environmentally friendly source (e.g. wind) and by burning a carbon fuel then how much of each input (wind or carbon fuel) the firm allocates to electricity production will come down to their relative cost.
- If the firm suffers a bad reputation for causing harm to the environment then the **reputational cost could also be internalized** within the production cost, which would make it more likely for the firm to choose or increase its use of the green source.

# Cost Concepts:



- A **production function** tells us **how much output a firm can produce** with its **existing plant and equipment**.
- The level of output depends on **prices and costs**.
- The **most desirable rate of output** is the one that **maximizes total profit** that is the **difference between total revenue and total cost**.
- Entrepreneurs **pay for the input factors**- Wages for labour, price for raw material, rent for building hired, interest for borrowed money. All these costs are included in the **cost of production**.
- The economist's concept of cost of production is different from accounting. Many decisions managers take are based on the cost analysis.

# Cost Concepts:



## Cost Determinants

- 1. Level of output:** The cost of production varies according to the quantum of output.
- 2. Price of input factors:** A **rise in the cost of input** factors will **increase** the total cost of production.
- 3. Productivities of factors of production:** When the **productivity of the input factors is high** then the cost of production will **fall**.
- 4. Size of plant:** The cost of production will be **low in large plants** due to mass production with mechanization.
- 5. Output stability:** The overall cost of production is **low** when the **output is stable** over a period of time.
- 6. Lot size:** **Larger the size of production per batch** then the **cost of production will come down** because the organizations enjoy economies of scale.
- 7. Laws of returns:** The cost of production will **increase** if the **law of diminishing returns** applies in the firm.
- 8. Levels of capacity utilization:** **Higher the capacity utilization, lower** the cost of production

# Cost Concepts:



- 9. Time period:** In the long run cost of production will be stable.
- 10. Technology:** When the organization follows **advanced technology** in their process then the cost of production will be **low**.
- 11. Experience:** over a period of time the experience in production process will help the firm to reduce cost of production.
- 12. Process of range of products:** **Higher the range of products** produced, **lower** the cost of production.
- 13. Supply chain and logistics:** **Better the logistics and supply chain**, **lower** the cost of production.
- 14. Government incentives:** If the **government provides incentives on input factors** then the cost of production will be **low**.

# Types of Costs



- 1. Actual cost/ Outlay cost/ Absolute cost / Accounting cost:** The cost or expenditure which a firm **incurs for producing** or acquiring a good or service. (Eg. Raw material cost). Accounting cost is the recorded cost of a business activity.
- 2. Opportunity cost:** Opportunity cost is the **forgone benefit** that would have been derived by an option not chosen. It is the revenue which could have been earned by employing that good or service in some other alternative uses. (Eg. A land owned by the firm does not pay rent. Thus a rent is an income forgone by not letting it out).
- 3. Sunk cost:** Cost that are retrospective (past) costs that have already been incurred and cannot be recovered.
- 4. Historical cost:** A historical cost is a measure of value used in accounting in which the value of an asset on the balance sheet is recorded at its original cost when acquired by the company.
- 5. Replacement cost:** Replacement cost is a term referring to the amount of money a business must currently spend to replace an essential asset with one of the same or higher value.

# Types of Costs



**6. Incremental cost:** Incremental cost is the total cost incurred due to an additional unit of product being produced.

**7. Explicit cost:** Explicit costs are normal business costs that **appear in the general ledger and directly affect** a company's profitability.

**8. Implicit cost:** An implicit cost is any cost that has **already occurred but not necessarily shown** or reported as a separate expense. It represents an opportunity cost that arises when a company uses internal resources toward a project without any explicit compensation for the utilization of resources.

**9. Book cost:** Costs which **do not involve any cash payments but a provision is made in the books of accounts** in order to include them in the profit and loss account to take tax advantages.

**10. Social cost:** **Total cost incurred by the society** on account of production of a good or service.

# Types of Costs



**11. Transaction cost:** Transaction costs are expenses incurred when buying or selling a good or service. Transaction costs represent the labor required to bring a good or service to market, giving rise to entire industries dedicated to facilitating exchanges.

**12. Controllable cost:** Controllable costs are those **costs that can be altered** in the short term. More specifically, a cost is considered to be controllable **if the decision to incur it resides with one person**. Also, if a cost is imposed on an organization by a third party (such as taxes), this cost is not considered to be controllable.

**13. Shut down cost:** The price of a product below which it is cheaper for a company not to make the product than to continue to sell it.

**14. Economic costs:** These are **costs related to future**. They play a vital role in business decisions as the costs considered in decision - making are usually future costs. They are similar in nature to that of **incremental, imputed explicit and opportunity costs**.

# Short-Run Cost Functions



- **Short-run** → some factors of production are **fixed** and others are **variable**.
- **Short-run** → **not defined by** some specified length of time but, by the **variability of factors** of production.
- In the **short-run**, a firm incurs some costs - **variable costs and fixed costs**.
- Long run and short run costs **of every firms varies**.
- **Variable costs (VC)** change as the level of output changes and therefore can be expressed as a function of output (Q), that is  **$VC = f(Q)$** .
- **Fixed cost**- Remains **fixed** irrespective of quantity of production.
- **Variable costs = arises out of production**(**raw material, labor, and utilities.**)

## Managerial Uses of the Short-Run Cost Concepts:

- Total cost is quite in finding out the break-even quantity of output.
- It is also used to find out whether firm is making profits or not.
- The AV is important for calculating the per unit profit of a business firm.
- The marginal and incremental cost concepts are essential to decide whether a firm should expand its production or not.

Total Product (1)	Total cost data, per week			Average-cost data, per week			
	Total Fixed Cost (TFC) (2)	Total variable cost (TVC) (3)	Total cost (TC) (4) = (2) + (3)	Average fixed cost AFC = TFC/Q (5)	Average variable cost AVC = TVC/Q (6)	Average Total cost ATC = TC/Q (7)	Marginal cost, MC = Change in TC/ Change in Q (8)
0	100	0	100				
1	100	90	190	100.00	90.00	190.00	90
2	100	170	270	50.00	85.00	135.00	80
3	100	240	240	33.33	80.00	113.33	70
4	100	300	400	25.00	75.00	100.00	60
5	100	370	470	20.00	74.00	94.00	70
6	100	450	550	16.67	75.00	91.67	80
7	100	540	640	14.29	77.14	91.43	90
8	100	650	750	12.50	81.25	93.75	110
9	100	780	880	11.11	86.25	97.78	130
10	100	930	1030	10.00	86.67	103.00	150
					93.00		

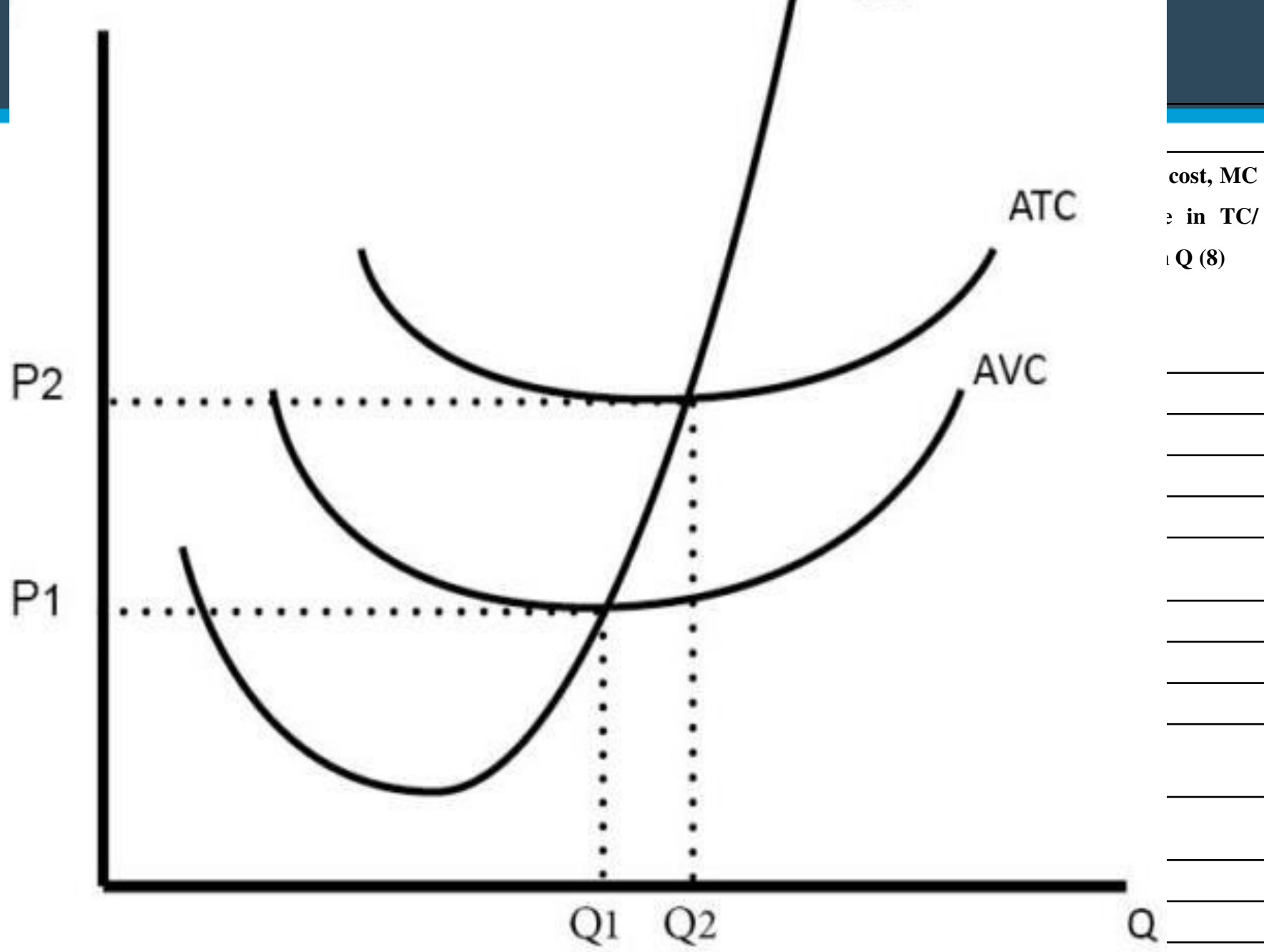
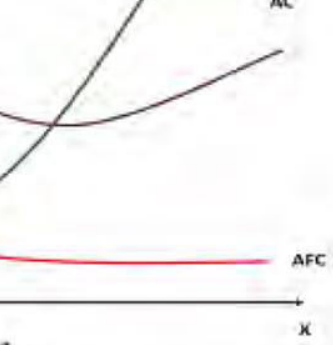
- Total Cost
- Per Unit, or Average Costs = TC/Q
- Average Fixed Costs = TFC/Q
- Average Variable Costs = TVC/Q

AVC declines initially, reaches a minimum, and then increases again,

- Average total cost (ATC) = TC/Q = AFC + AVC

**Marginal Cost** = Change in TC/ Change in Q =  $\Delta TC / \Delta Q$

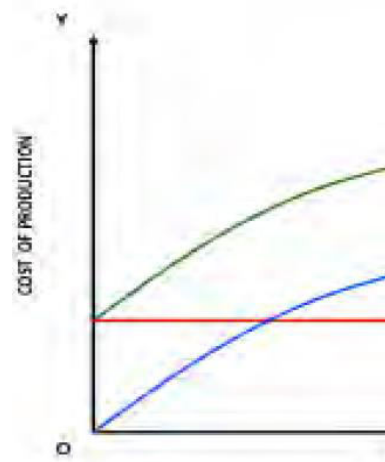




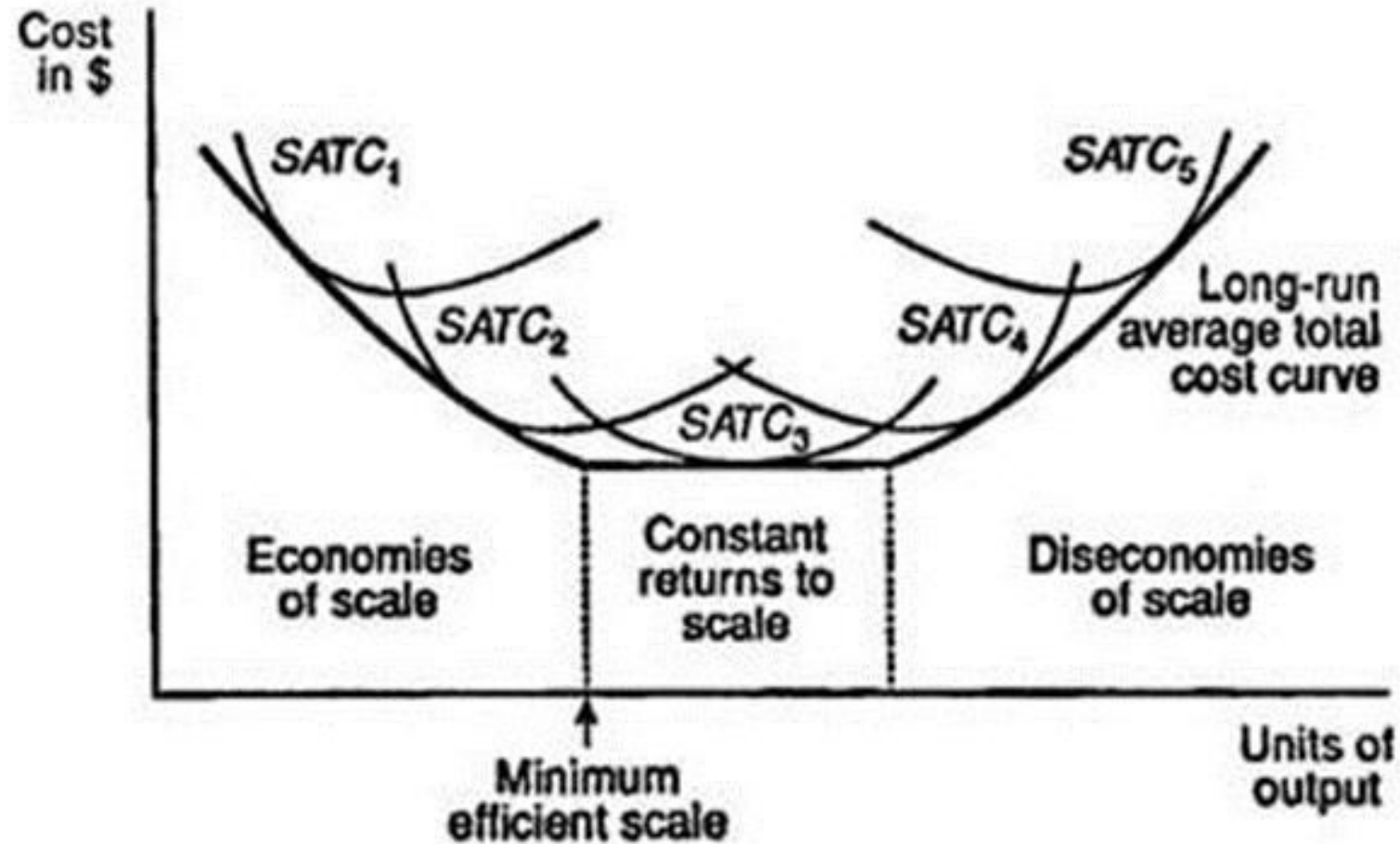
cost, MC  
 e in TC/  
 Q (8)



Graph - T



# Long-Run Cost Functions



- Long-run cost functions are U-shaped.
- Such a curve is the lower envelope of a series of short-run average total cost curves that differ in scale.
- The minimum efficient scale is the output level at which the long-run average total cost curve is at its lowest point.
  - C (SATC<sub>3</sub>), D (SATC<sub>4</sub>) and E (SATC<sub>5</sub>) represent total cost on resources.
- Since the **cost per unit of capital (v) and, labour (w)** are assumed to be **constant**, these **five cost curves are parallel to one another**, and the **distance between them** is **constant** along the expansion path traced out by A, B, C, D and E.

# Long-Run Cost Functions



## Unit Costs in the Long-Run:

- In the long-run, costs are **not divided** into **fixed and variable** components; all costs are variable.
- Thus, in long-run unit cost functions we have long-run average cost (LAC) and long-run marginal cost (LMC). These are defined as follows:

$$\text{LAC} = \frac{\text{LTC}}{Q} ; \text{LMC} = \frac{\Delta \text{LTC}}{\Delta Q} ; \text{LMC} = \frac{d(\text{LTC})}{dQ}$$

- For the long-run total cost, these unit costs can be presented in tabular form as follows:

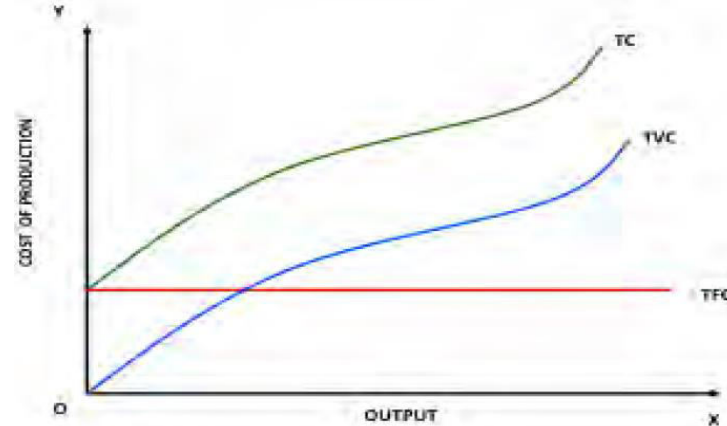
Output Q	Long Run Total Cost (LTC)	Long Run Average Cost (LAC)	Long Run Marginal Cost (LMC)
0	0	--	--
50	150	3.00	3.00
125	200	1.60	0.67
250	250	1.00	0.67
300	300	1.00	1.00
325	350	1.08	2.00

# Inter-relationship of cost:



## Short Run Cost Output Relationship:

Graph – Total Cost Curves



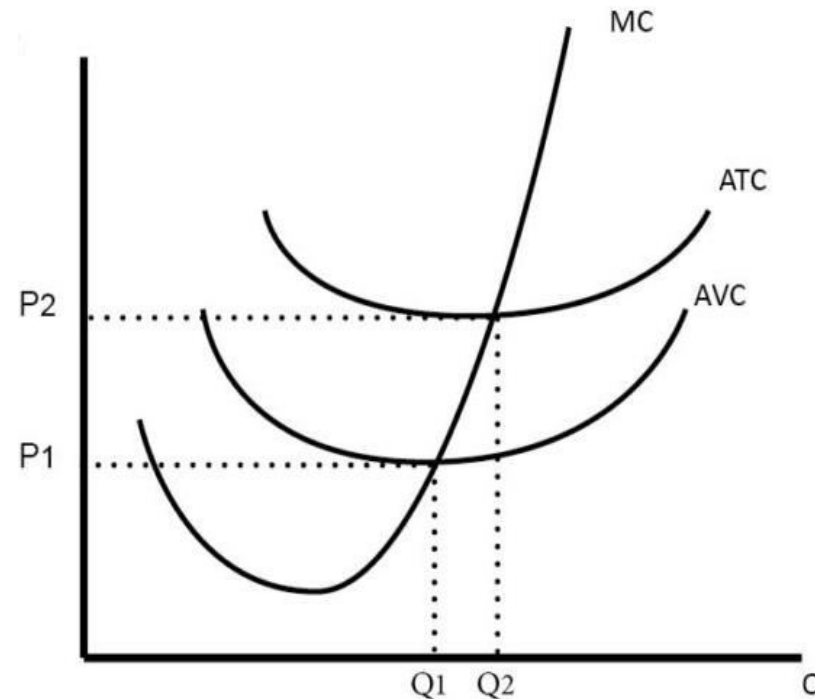
- Total fixed costs as a horizontal straight line because the FC remains constant at all levels of output.
- The curves TC and TVC are parallel to each other. The vertical distance between them is as same as TFC.
- As output increases the average cost decreases until maximum capacity of the equipment and scale used in the factory.
- If production is pushed beyond this level, without changing the equipment and scale, difficulties will arise leading to diminishing returns or increasing costs .

# Short-Run Cost Functions



## Relationship of MC to AVC and ATC:

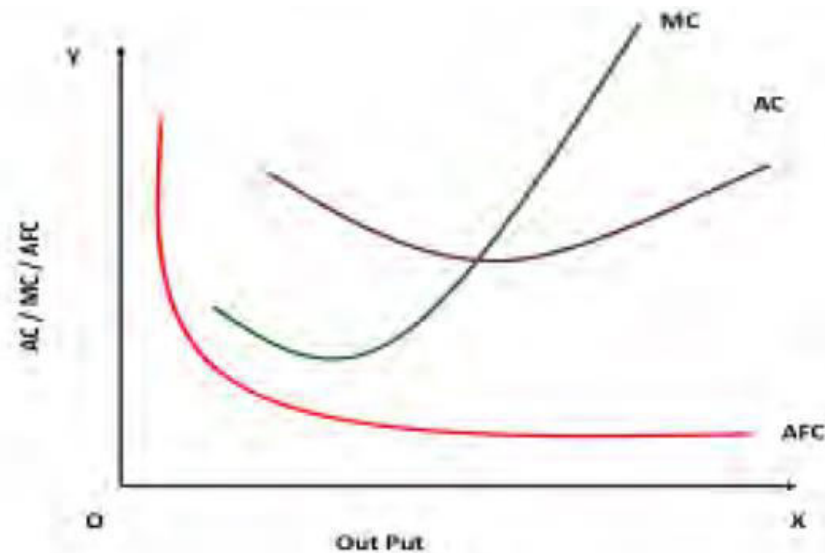
- Marginal cost cuts both AVC and ATC at their minimum when both the MC and AVC are falling.
- When MC and AVC are both rising, MC will rise at a faster rate. As a result, MC will attain its minimum before the AVC.
- When MC is less than AVC, the AVC will fall, and when MC exceeds AVC, AVC will rise.
- At the point of intersection where  $MC=AVC$ , AVC has attained its minimum.
- However, no such relationship exists between MC and the average fixed cost.



# Inter-relationship of cost:



## Short Run Cost Output Relationship:



- AFC curve declines as output increases and then remains almost constant as output increases.
- The MC curve slopes like a tick mark which declines up to an extent then it starts increasing along with the output.
- The AC curves is U shaped because of law of diminishing returns.
- The MC curve cuts the AC curve and AVC curves from below, at their lowest point.
- The AC curve is above the MC curve when AC is falling. The AC curve is below the MC when AC is increasing.
- The intersecting point indicates that **AC=MC** and that is the **minimum average cost with an optimum output**.

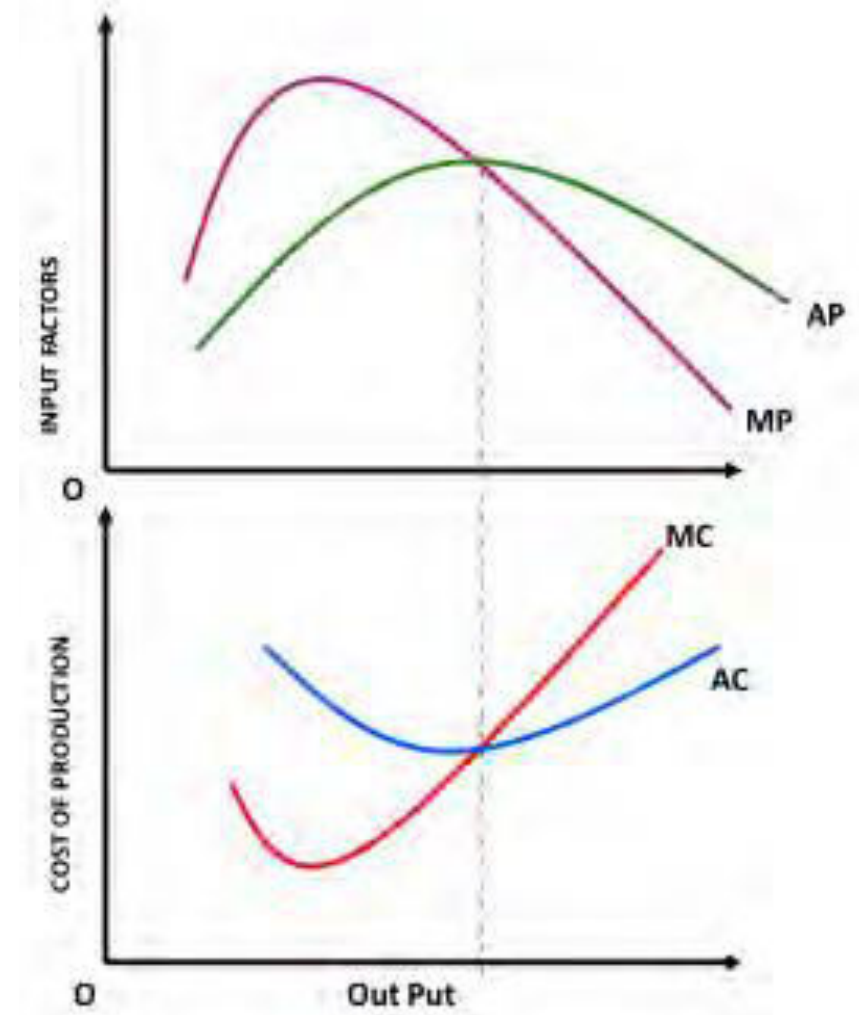
# Inter-relationship of cost:

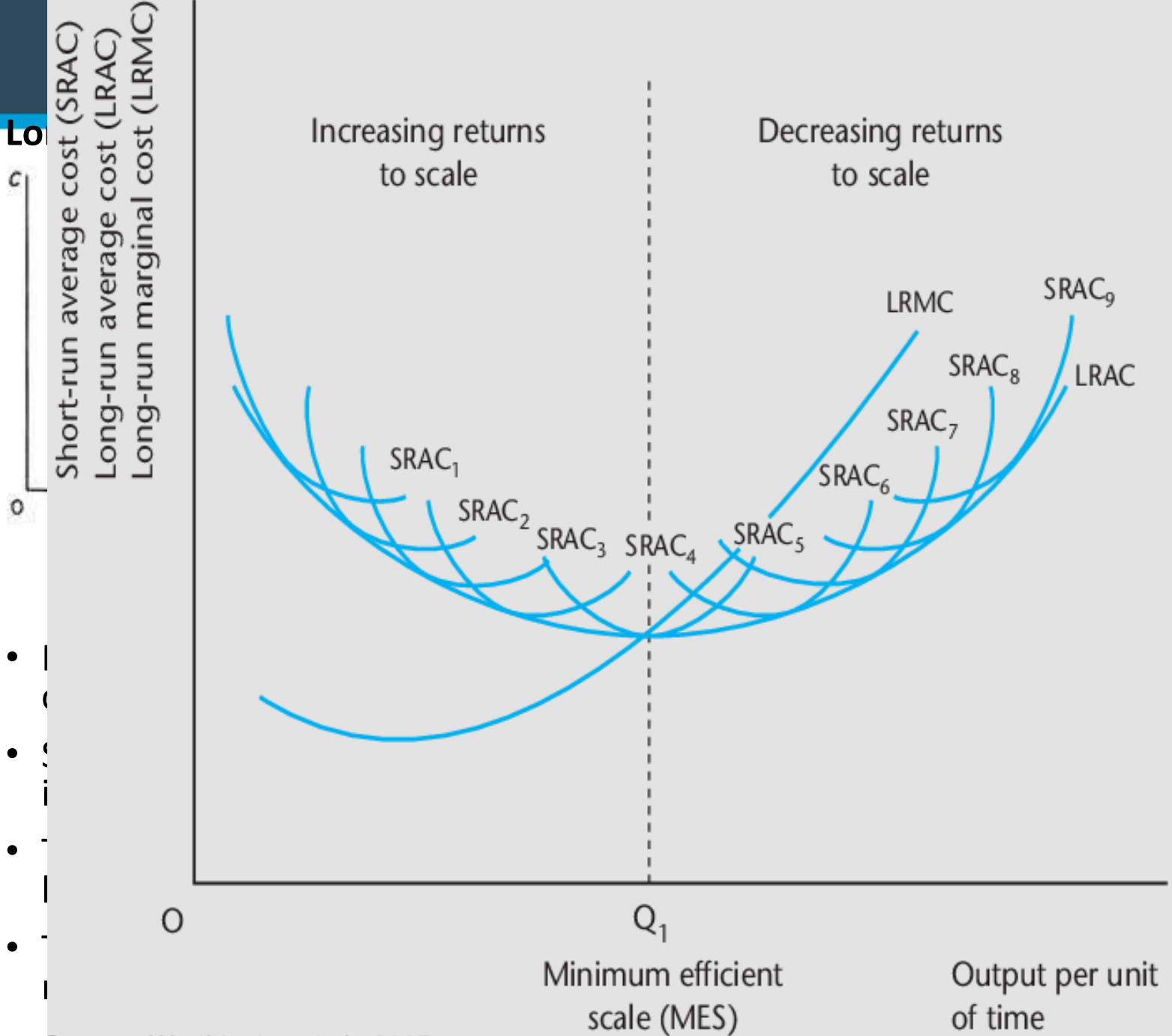


## Short Run Cost Output Relationship:

### Optimum Output and Minimum Cost

- All organizations aim for **maximum(optimum) output with minimum(average) cost.**
- The **MP=AP** at maximum average production.
- At **MC = AC** at minimum average variable cost.





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$Q_1$

Minimum efficient  
scale (MES)

Output per unit  
of time

Short-run average cost (SRAC)  
Long-run average cost (LRAC)  
Long-run marginal cost (LRMC)

Increasing returns  
to scale

Decreasing returns  
to scale

LRMC

$SRAC_9$

LRAC

$SRAC_8$

$SRAC_7$

$SRAC_6$

$SRAC_5$

$SRAC_4$

$SRAC_3$

$SRAC_2$

$SRAC_1$

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# Cost control:



- **Institute of Cost and Management Accountants, London**, defines ‘**cost control**’ as “the **guidance and regulation** by executive action of the costs of operating an undertaking, particularly where such action is guided by cost accounting.”
- **Cost control** is achieved by **fixing standards of performance**, **collecting actual cost data** for each area of responsibility, **comparing actual data with standards** and **forwarding prompt report** to top management **highlighting the deviations from standards** from **immediate corrective action**. Thus, cost control compels actual costs to conform to planned costs.

## Features of Cost Control:

### a. Existence of Cost Accounting:

- The cost control system can be introduced only if cost accounting practices are designed to suit the undertaking.
- The cost accounting system so installed, accomplishes one of the twin objectives of cost accounting, viz., **cost ascertainment and cost control**.

# Cost control:



## b. Predetermined Standards:

- Another requirement of cost control is the **fixation of attainable targets of performance**.
- The targets set, should be scientific, taking into consideration all practical aspects governing production as well as the related costs.

## c. Cost Reporting:

- **Executive action for cost control** should be **guided by cost accounting**.
- There should be an **effective system of reporting** cost information.
- The reports **should point significant deviations** from the predetermined targets, and not merely historical costs.
- Cost reporting is to be accomplished at the appropriate time and not when it is too late to do anything.

## d. Corrective Action:

- **Action should also be taken** to see that significant deviations which are now corrected by executive action are not allowed to appear all over again.
- In other words, corrective action should **be to prevent the recurrence of deviations**.

# Cost reduction:



- Cost reduction is “the **achievement of real and permanent reduction** in the **unit cost** of goods manufactured or services rendered **without impairing their suitability for use intended.**” CIMA (England).

Cost reduction may be effected in two ways-

(i) by reducing the cost per unit; and

(ii) by increasing productivity. Cost reduction has to be effected within the organisation.

## **Features of Cost Reduction:**

### **(a) Reduction in Unit Costs:**

- The aim of cost reduction is to bring down the cost per unit of a commodity or service.
- Unit cost may come down if the prices of input factors also come down. But, the prices of inputs will rise owing to limited supply for natural causes. Consequently, cost per unit of the finished product also rises.
- What is therefore, needed is a change in the methods of production, new design, increase in productivity, new standards, etc.

# Cost reduction:



## (b) Reduction to be Permanent:

- Reduction In unit cost should not only be real but permanent also.
- A temporary reduction in the unit cost has no significance if, in the near future, cost per unit goes up for whatever reason.

## (c) Use Value to be Unaffected:

- Any article, produced with the available scarce resources has not only exchange value but use value also.
- Its **exchange value** is dependent upon **market forces**.
- However its **use value** depends entirely upon its **quality**.
- If, therefore, an article is to be put to the intended use, **its quality should be good enough**.
- Cost reduction should not be at the expense of its quality.
- Any **cost reduction should not impair or affect the suitability** of the article for the intended use.



thank  
you



THANK YOU

# Economics for Managers

Prof. Jagadeesh Babu MK

## **MODULE THREE: THEORY OF PRODUCTION AND ANALYSIS OF COST**

# Theory of Production



- Production is a process that **create/adds value** or **utility**
- It is the process in which the **inputs** are converted in to **outputs**.

## Inputs

- The factors of production such as Land, Labour, Capital, Technology ,etc

## Outputs

- The goods and service produced such as Soap, Omni Car ,etc

# Theory of Production

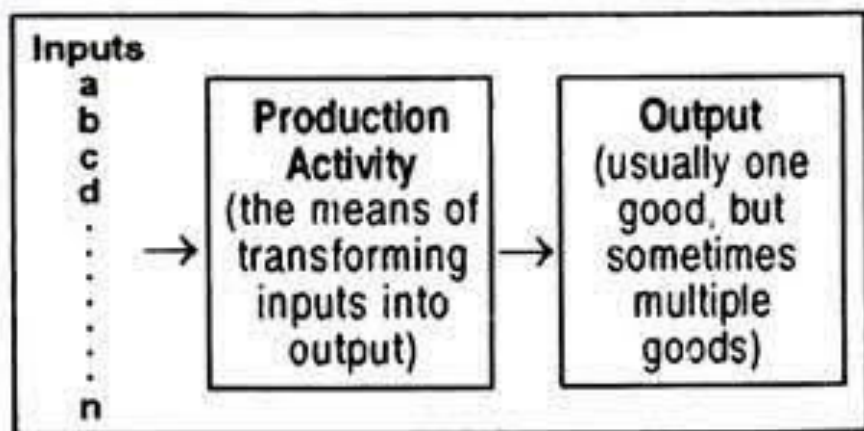
- Explain the **principles** by which a business firm decides
  - how much of each commodity that it will **sell or produce** (its “outputs” or “products”) and
  - how much of each kind of **labour, raw material, fixed capital good, etc.**, that it employs (its “inputs” or “factors of production”) in the process of production.

## Factors of Production

Land	<ul style="list-style-type: none"><li>• Natural resources such as surface, mineral, air, rivers, sea, etc</li><li>• Free gift of nature, fixed</li></ul>
Labour	<ul style="list-style-type: none"><li>• Mental or physical effort done by a man with the view of</li></ul>
Capital	<ul style="list-style-type: none"><li>• Man made goods used in the production process</li><li>• Most mobile factor</li></ul>
Organization	<ul style="list-style-type: none"><li>• Entrepreneur or coordinator of all other factors of production</li></ul>

# Theory of Production

- Theory of production include the
  - the **quantities of these commodities produced and productive factors used.**
  - **relationship between the prices of commodities and the prices (or wages or rents) of the productive factors** used to produce them.



## Factor of Production

Land  
Labor  
Capital  
Entrepreneurship

## Price

Rent  
Wage  
Interest  
Profits

# Theory of Production

- Various production related **decisions** that an enterprise makes can be classified into **three layers**.
- The **first layer** includes
  - **decisions** about **methods of producing** a given quantity of the **output** in a **plant** of given size and equipment, **at least cost**.
  - It involves the problem of what is called **short-run cost minimization**.
- The **second layer** including,
  - the **determination** of the **most profitable quantities** of products to produce in any given plant, deals with **short-run profit maximization**. ➡
- The **third layer** concerning,
  - the **determination** of the **most profitable size and equipment of plant**, relates to **long-run profit maximization**. ➡

## Total Product (TP)

- Total quantity of output produce with a given quantity of input.
- Total Product = Average Product x Total Variable Input

## Average Product (AP)

- Ratio of total production to total variable inputs (labour) used to produce a product.
- Average Product = Total Product / Total Variable Input

## Marginal Product (MP)

- The change in total production when variable inputs are increased in increments of one unit.
- Marginal product = change in TP / change in Total Variable Input

# Law of Variable Proportions:

- Law of Variable Proportions is also known as **Law of Proportionality**.

## Statement of law

Law of Variable Proportions states that as we increase quantity of only one input keeping other inputs fixed, total product (TP) initially increases at an increasing rate, then at a decreasing rate and finally at a negative rate.

LVP is also known as 'Law of Returns' or 'Returns to Variable factor'.

# Law of Variable Proportions:

- In the **short run**, when **output of a commodity** is sought **to be increased**, the law of variable proportions comes into operation.
- Short run means a period where one or more variables are fixed and one factor is variable.
- For instance, there are **two factors of production** viz., land and labour. **Land** is a **fixed factor** whereas **labour** is a **variable factor**.
- law of variable proportions explains the impact of variable factor on output, when all other factor of production are variable.

# Law of Variable Proportions:

- Now, suppose we have a **land** measuring **5 hectares**.
- We **grow wheat** on it with the **help of variable factor** i.e., labour.
- Accordingly, the proportion between **land and labour** will be **1: 5**.
- If the **number of labourers** is **increased to 2**, the new proportion between labour and land will be **2: 5**.
- Due to **change in the proportion of factors** there will also emerge a **change in total output at different rates**.
- This tendency in the theory of production called the **Law of Variable Proportion**.

Here in this example, what we are witnessing is changes in proportion of fixed factor and variable factor (**1:5 to 2:5**), leading to increase in output.

# Law of Variable Proportions:

## Assumptions:

### (i) Constant Technology:

- The state of technology is assumed to be given and constant. If there is an improvement in technology the production function will move upward.

### (ii) Factor Proportions are Variable:

- The law assumes that factor proportions are variable. If factors of production are to be combined in a fixed proportion, the law has no validity.

### (iii) Homogeneous Factor Units:

- The units of variable factor are homogeneous. Each unit is **identical in quality and amount with every other unit.**

### (iv) Short-Run:

- The law operates in the short-run when it is not possible to vary all factor inputs.

# Law of Variable Proportions:

## Explanation of the Law:

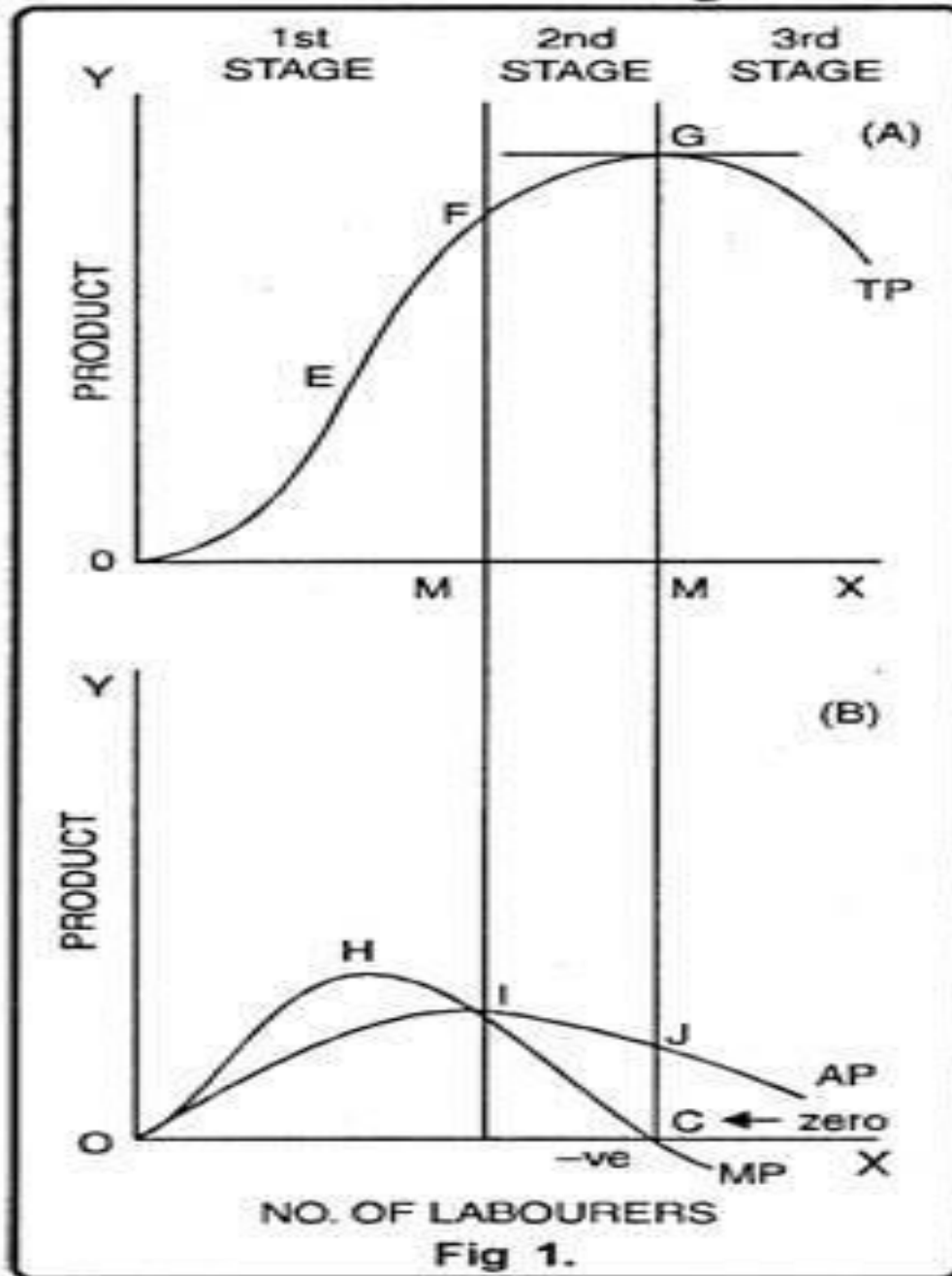
- In order to understand the law of variable proportions we take the example of agriculture.

Table 1.

Units of Land	Units of Labour	Total Production	Average Production	Marginal Production
10 Acres	0	—	—	—
"	1	20	20	20
"	2	50	25	30
"	3	90	30	40
"	4	120	30	30
"	5	140	28	20
"	6	150	25	10
"	7	150	21.3	0
"	8	140	17.5	-10

1st stage  
 MP > AP  
 AP = MP  
 2nd stage  
 MP = 0 and TP Maximum  
 3rd stage MP < 0

# Law of Variable Proportions:



# Law of Variable Proportions:

## Graphic Presentation:

- In fig. 1, on OX axis-number of laborers, OY axis -quantity of product. TP is total product curve. Up to **point 'E'**, TP is **increasing at increasing rate**. **Between points E and G** it is **increasing at the decreasing rate**.
- Up to point 'H' marginal product increases. At point 'H', i.e., when 3 units of labourers are employed, it is maximum. After that **marginal product(MP)** starts **falling** reaching **zero at C** and then **negative**.
- AP curve represents average product. Before point 'I', **AP** is **less than MP**. At **point 'I'** **AP** is **maximum**. **Up to point I, AP** increases but after that it starts to diminish.

# Law of Variable Proportions:

Total Product	Marginal Product	Average Product
<b>Stage I</b> First increases at increasing rate then at diminishing rate.	Increases in the beginning then reaches a maximum and begins to decrease.	First increases, continues to increase and becomes maximum.
<b>Stage II</b> Continues to increase at diminishing rate and becomes maximum.	Continues to diminish and becomes equal to zero.	Becomes equal to MP and then begins to diminish.
<b>Stage III</b> Diminishes	Becomes negative.	Continues to diminish but will always be greater than zero.

- **Stage I** – AP is **increasing**, so that TP must also be **increasing**. This means that the efficiency of the variable factor of production is increasing. The efficiency of b, the fixed factor, is also increasing.
- **Stage II**- **decreasing AP and a decreasing MP**, but with **MP not negative**. Thus, the **efficiency of the variable factor is falling**, while the **efficiency of b, the fixed factor, is increasing**, since the TP with **b1** continues to increase.
- **Stage III** - **falling AP and MP**, and further by **negative MP**. Thus, the **efficiency of both the fixed and variable factor is decreasing**.

# Law of Variable Proportions:

## Rational Decision:

- Production **will not take place** in either **stage III and stage I**. Thus, a rational producer will operate in stage II. This is because, at **stage 1 each variable input is increasingly more productive**, firms employ as many as they can, as quickly as they can. **Stage III**, with **negative marginal returns**, is not particularly attractive to firms.
- Suppose **b were a free resource**; i.e., it commanded no price. An entrepreneur would want to **achieve the greatest efficiency possible from the factor for which he is paying**, i.e., from **factor a**. Thus, he would want to produce where **AP is maximum**, **boundary between stage I and II**.
- Other hand, **a were the free resource**, then he would want to **employ b to its most efficient point**; **boundary between stage II and III**.
- **Both resources commanded a price**, he would **produce somewhere in stage II**. At what place in this stage production takes place would depend upon the relative prices of a and b.

# Law of Returns to Scale:

- The law of returns is different from the law of returns to scale.
- The **law of returns** operates in the **short period**. It explains the production behaviour of the firm with **one factor variable while other factors are kept constant**.
- Whereas the **law of returns to scale** operates in the **long period**. It explains the production behaviour of the firm with **all variable factors**.
- The **law of returns to scale** describes the **relationship between variable inputs and output** when all the inputs, or factors are **increased** in the **same proportion**.
- Here we find out in **what proportions the output changes** when there is **proportionate change in the quantities of all inputs**.
- The answer to this question helps a firm to determine **its scale or size in the long run**.

# Table: Law of returns to scale

Factor combination	Scale of inputs (labour & capital in units)	TP (in quintals)	MP (in quintals)
IRS	2+1	20	20
	4+2	50	30
	6+3	90	40
CRS	8+4	140	50
	10+5	190	50
	12+6	240	50
	14+7	290	50
DRS	16+8	320	30
	18+9	340	20
	20+10	350	10

# Law of Returns to Scale:

- These three laws of returns to scale:

## (1) Increasing Returns to Scale:

If the **output** of a firm **increases more than** in proportion to an **equal percentage increase in all inputs**, the production is said to exhibit increasing returns to scale.

For example, if the amount of **inputs are doubled** and the **output increases by more than double**, it is said to be an increasing returns to scale.

When there is an **increase in the scale of production**, it leads to **lower average cost per unit** produced as the firm enjoys economies of scale.

## (2) Constant Returns to Scale:

- When all **inputs are increased by a certain percentage**, the **output increases by the same percentage**.
- For example, if a firm **doubles inputs**, it **doubles output**.
- The constant scale of production has **no effect on average cost per unit produced**.

# Law of Returns to Scale:

## (3) Diminishing Returns to Scale:

- The term 'diminishing' returns to scale refers to scale where **output increases in a smaller proportion than the increase in all inputs.**
- If a firm **increases inputs by 100%** but the **output decreases by less than 100%**, the firm is said to exhibit decreasing returns to scale.
- In case of decreasing returns to scale, the firm faces **diseconomies of scale.**
- The firm's scale of production leads to **higher average cost per unit produced.**

# Law of Returns to Scale:

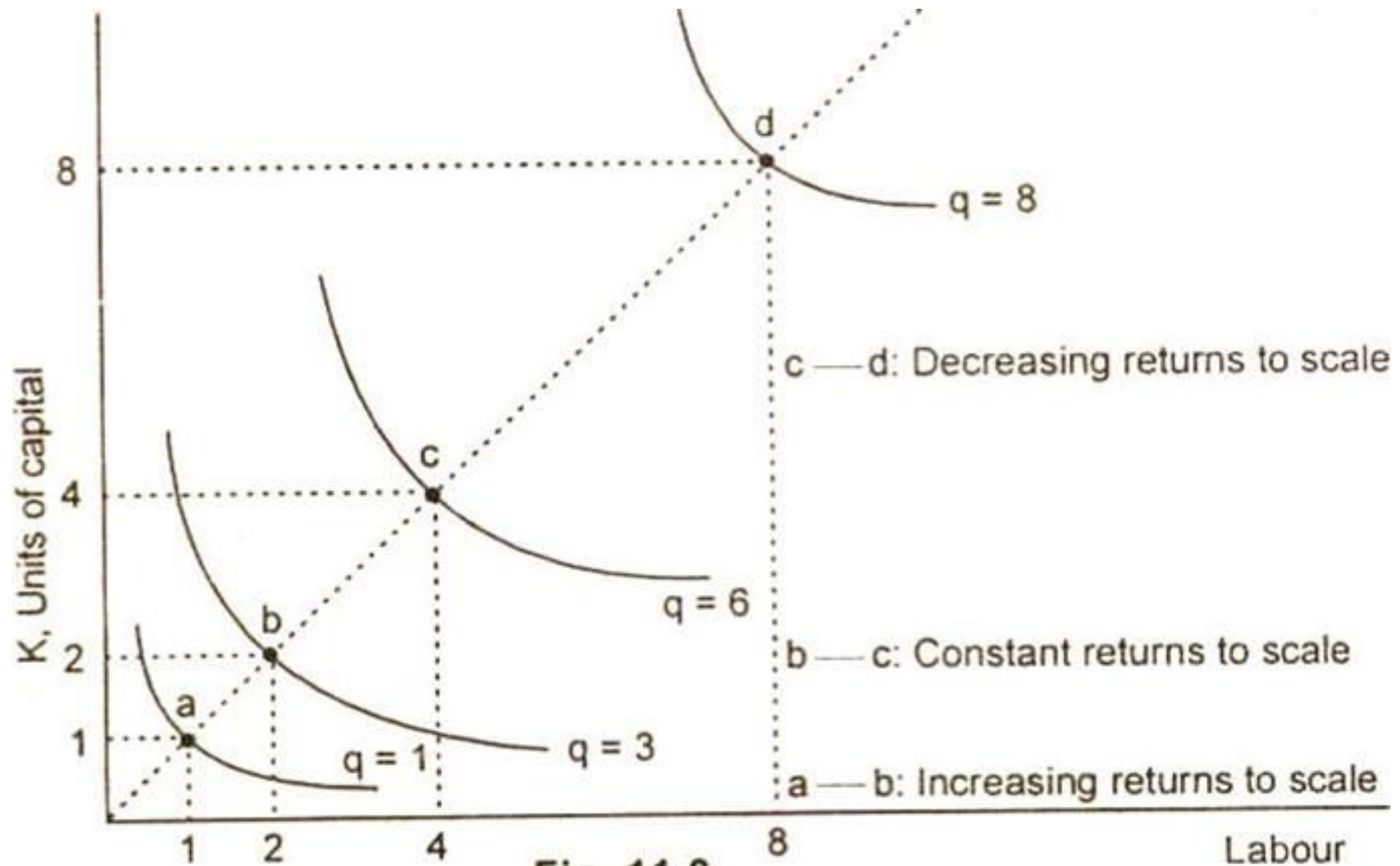


Fig. 11.6

# ECONOMIES OF SCALE

- Economies of scale refer to the **cost advantage experienced** by a firm when it **increases its level of output**.



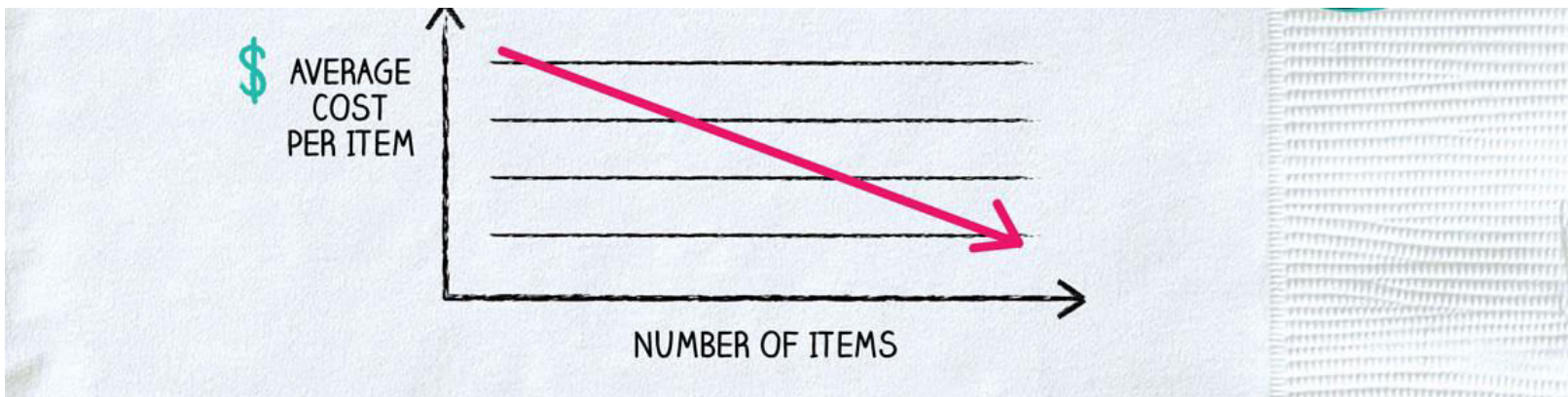
- The advantage arises due to the inverse relationship between per-unit fixed cost and the quantity produced.

# Economies of scale

- The **greater** the quantity of output produced, the **lower the per-unit fixed cost**.
- Economies of scale also result in a **fall in average variable costs** (average non-fixed costs) with an increase in output.
- This is brought about by **operational efficiencies and synergies** as a result of an **increase in the scale of production**.

## Effects of Economies of Scale on Production Costs

1. It **reduces** the **per-unit fixed cost**. As a result of increased production, the fixed cost gets spread over more output than before.
2. It **reduces** **per-unit variable costs**. This occurs as the expanded scale of production increases the efficiency of the production process.



# Economies of scale

## Types of Economies of Scale



### Internal

The sheer size of the company allowing bulk purchases.



### External

Receiving preferential treatment from government or other external sources.

## 1. Internal Economies of Scale

- This refers to economies that are **unique to a firm**.
- For instance, a firm may hold a **patent** over a **mass production machine**, which allows it to **lower its average cost of production** more than other firms in the industry.

## 2. External Economies of Scale

- These refer to economies of scale enjoyed by an **entire industry**.
- For instance, suppose the government wants to **increase steel production**. In order to do so, the government announces that **all steel producers who employ more than 10,000 workers** will be given a **20% tax break**. Thus, firms employing less than 10,000 workers can potentially lower their **average cost of production** by employing more workers. This is an example of an external economy of scale – one that affects an entire industry or sector of the economy.

# Diseconomies Of Scale In A Nutshell

In Economics, Diseconomies of Scale happens when a company has grown so large that its costs per unit will start to increase. Thus, losing the benefits of scale. That might happens for several reasons, such as coordination and management costs and communication inefficiencies as the company becomes too big.



# Isoquant and Iso-cost Line

The firm's cost, depends on **two key factors**, viz.:

(1) **The technical relation** between **inputs and output** (i.e., how outputs vary as inputs vary), and

(2) **Factor prices** (i.e., the price of labour or the wages, the price of capital or the interest rate and so on).

## ISOQUANT:

- The **long-run production function** of a firm involving the **usage of two factors**, say, capital and labour is represented by **equal-product curve or isoquant**. This curve is also known as a **producer's indifference curve**.
- An **isoquant traces out** the **combinations of any** two inputs **which yield the** same level of output.
- This combinations must be the **most efficient ones** — i.e., any point on an **isoquant shows** the **minimum quantities of the inputs required to produce a given output**.
- Isoquants are typically drawn as being convex to the origin because of the assumed substitutability of inputs.

# Isoquant and Iso-cost Line

## Isoquants:

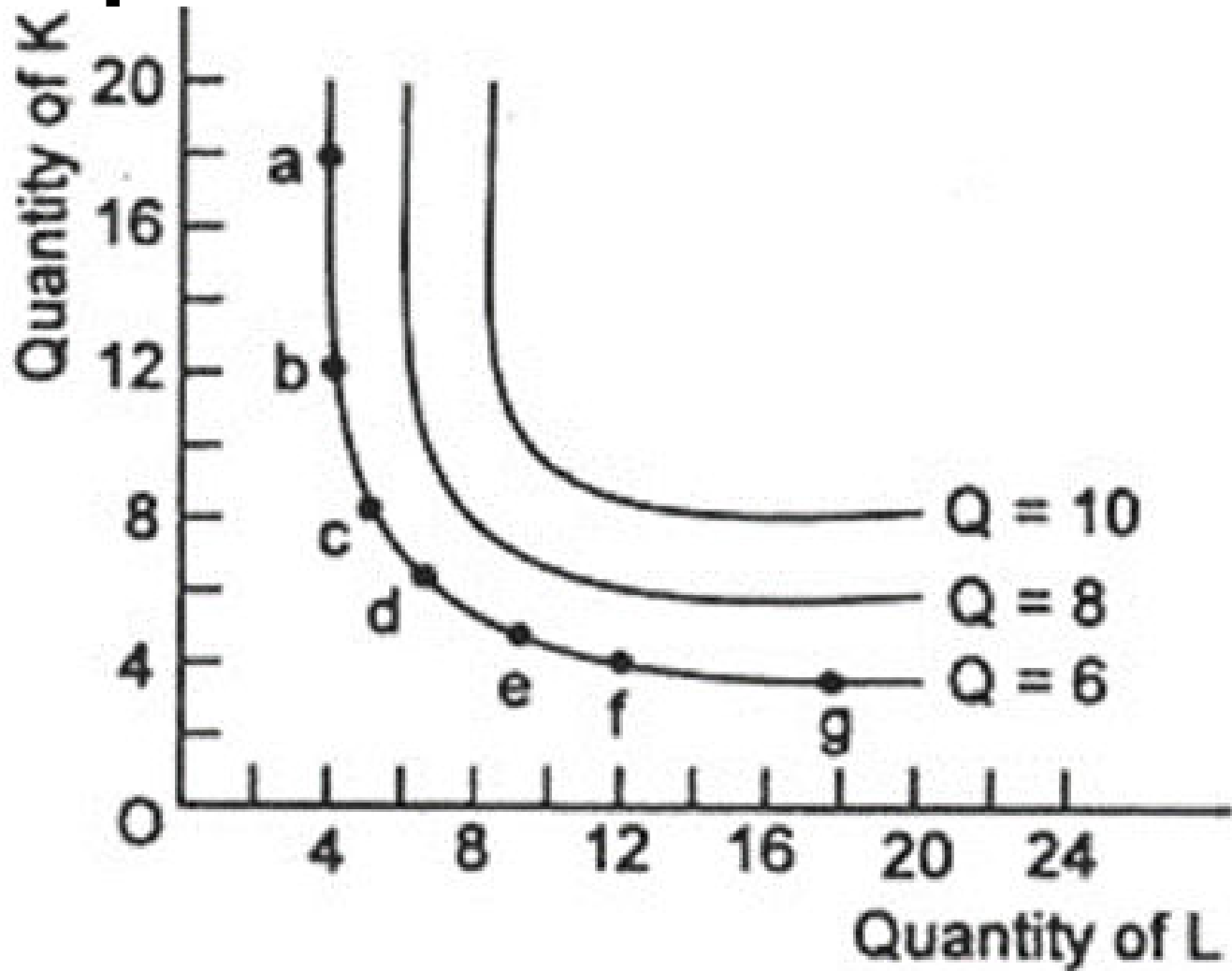
- An isoquant is a locus of points showing all the **technically efficient** ways of **combining factors of production** to produce a **fixed level of output**.
- It is also known as the **equal product curve**.
- In case of two variable factors, labour and capital, an isoquant appears as a curve on a graph the axes of which measure quantities of the two

**Table 1 : Alternative Methods of Producing Six Units of Output**

Method	Units of K	Units of L
<i>a</i>	18	2
<i>b</i>	12	3
<i>c</i>	9	4
<i>d</i>	6	6
<i>e</i>	4	9
<i>f</i>	3	12
<i>g</i>	2	18

# Isoquant and Iso-cost Line

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- Each curve shows the alternative combinations of labour and capital that would produce 8 and 10 units of output, respectively. We could draw as many isoquants as we like.

vel

# Isoquant and Iso-cost Line

## Iso-cost Lines:

- An isoquant **shows what a firm is desirous of producing**. But, the desire to produce a commodity is not enough.
- The producer must have **sufficient capacity to buy** necessary factor inputs to be able to reach its desired production level.
- The **capacity of the producer** is shown by his **monetary resources, i.e., his cost outlay** (or how much money he is capable of spending) on capital and labour, the prices of which are taken as constant, i.e., given in the market place. So, like the consumer the producer has also to operate under a **budget (resource) constraint**.
- This is picturized by his budget line called **iso-cost line**.
- An **isocost curve** is a curve showing the **combinations of factor inputs that have constant market cost**. If firms are acting as price-takers in factor markets, the isocost curve is a straight line, whose slope represents the relative prices of different factors' services.

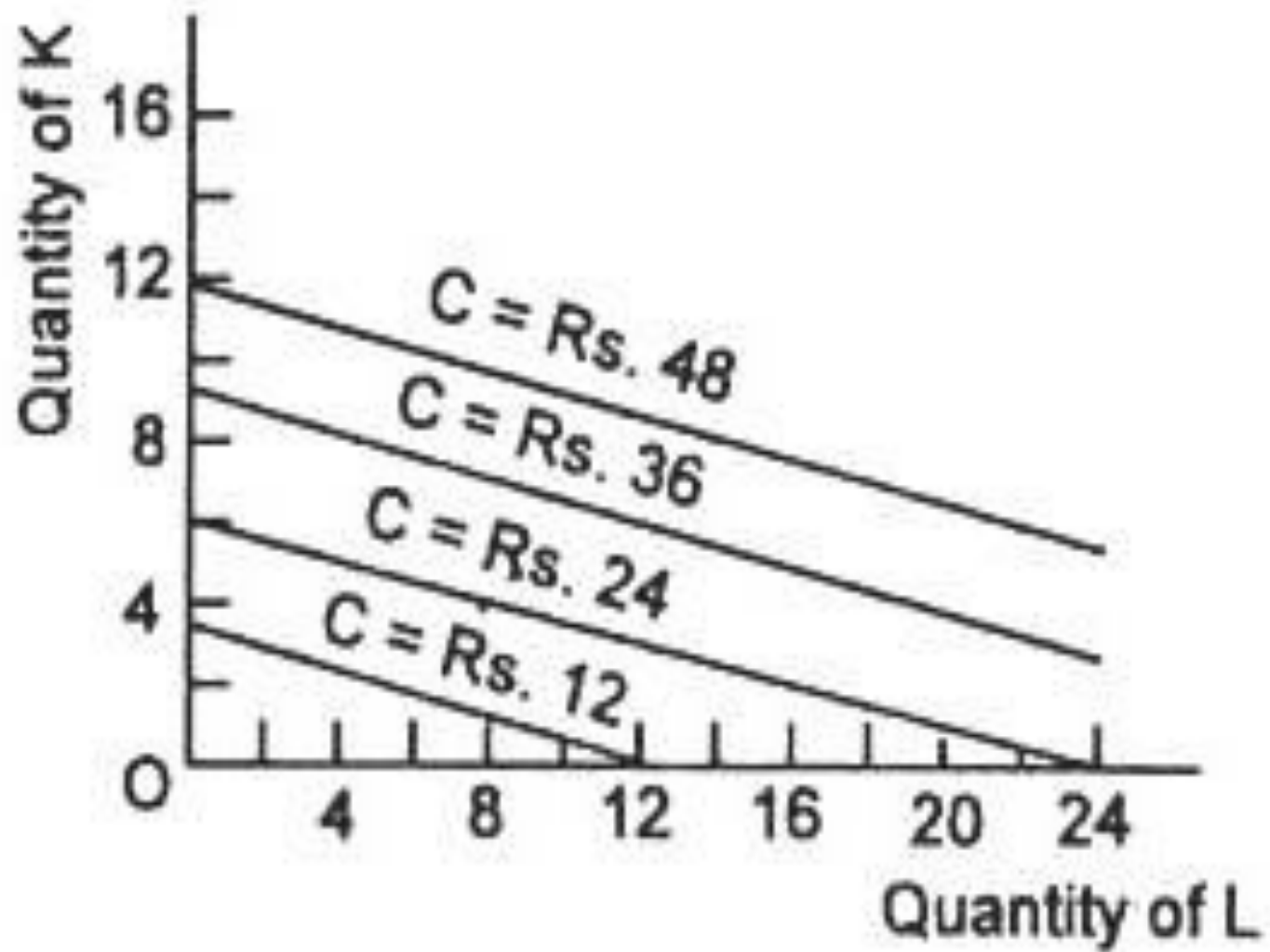
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# Isoquant and Iso-cost Line

Isocost lines  $C = \text{Rs. } 12$ ,  $C = \text{Rs. } 24$  and  $C = \text{Rs. } 48$  show the alternative combinations of capital and labour that can be purchased or hired by spending Rs. 12, Rs. 24 and Rs. 48, respectively.

- These lines are **straight lines** because **factor prices are constant** and they have a **negative slope equal to the factor-price ratio**, i.e., the ratio of labour price to capital price (i.e., the wage ratio -5- the rate of interest).

# Optimum combination of inputs

- In the **long run**, all factors of production can be **varied**.
- The **profit maximization firm** will choose the **least cost combination of factors to produce** at any given level of output.
- The **least cost combination** or the **optimum factor combination** refers to the **combination of factors** with which a firm can produce a **specific quantity of output at the lowest possible cost**.

## Explanation:

There are two methods of explaining the optimum combination of factor:

- (i) **The marginal product approach.**
- (ii) **The isoquant / isocost approach.**

# Optimum combination of inputs

## (i) The Marginal Product Approach:

- In the **long run**, a firm who focus on **profit maximization** will obviously want to **use that mix of factor combination which is least costly**
- In search of **h**  
**than the othe**
- When the **las**  
**the firm is ma**
- The least cost  
when:

$$\frac{Mpp_a}{P_a} = \frac{Mpp_b}{P_b} = \frac{Mpp_c}{P_c} = \frac{Mpp_n}{P_n}$$

$$\begin{array}{ccc} 10 & 10 & 10 \\ 50/4=30/8=60/9 & & 18 \quad 7 \quad 13 \\ 12.5=3.75=6.67 & & 4.35 \quad 4.35 \quad 4.35 \end{array}$$

Where, a, b, c, n - different factors of production.

Mpp is the marginal physical product.

A firm will **reduce its cost** by using **more** of those factors with a **high Mpp / P** ratios and **less** of those with a **low Mpp / P** ratio until they all become equal.

<b>Labor</b>	<b>Total Product</b>	<b>Marginal Physical Product</b>	<b>Marginal Revenue Product</b>
0	0		
1	20	20	40
2	50	30	60
3	75	25	50
4	95	20	40
5	110	15	30
6	120	10	20
7	125	5	10
8	125	0	0

# Optimum combination of inputs

- **(ii) The Isoquant / Isocost Approach:**
- The **least cost combination of factors or producer's equilibrium** is now explained with the help of iso-product curves and iso-costs.
- The optimum factors combination or the least cost combination refers to the combination of factors with which a firm can produce a **specific quantity of output at the lowest possible cost**.
- As we know, there are a number of combinations of factors which can yield a given level of output. The producer has to choose, one **combination** out of these **which yields a given level of output with least possible outlay**.
- The **least cost combination of factors** for any level of output is that where the **iso-product curve is tangent to an iso-cost curve**.

# Optimum combination of inputs

The analysis of producers' equilibrium is based on the following assumptions:

- (a) There are **two factors** X and Y in the combinations.
- (b) All the units of factor X are **homogeneous** and so is the case with units of factor Y.
- (c) The **prices of factors** X and Y **are given and constants**.
- (d) The **total money outlay** is also given.
- (e) In the factor market, it is the **perfect completion** which prevails.

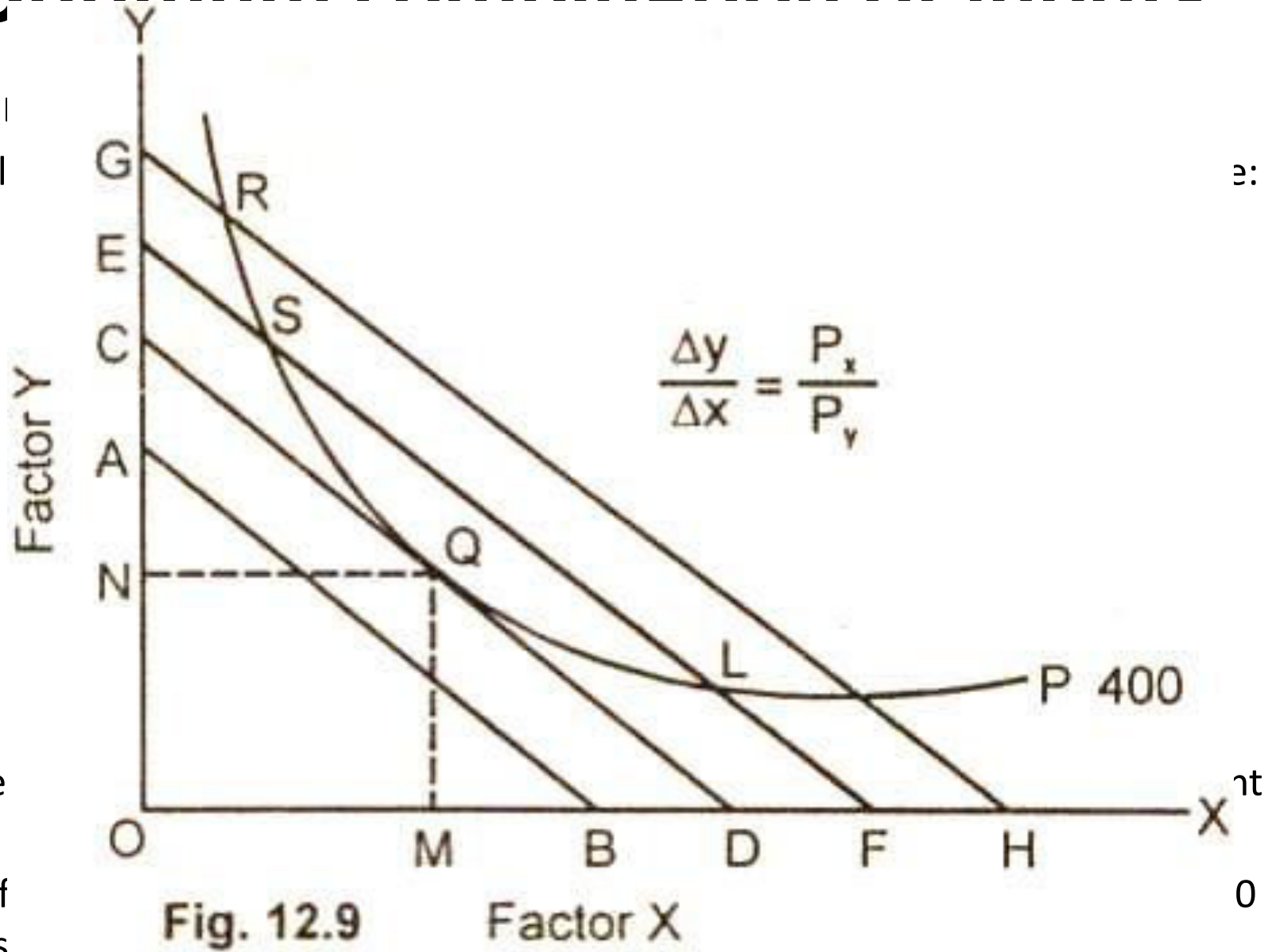
Under the conditions assumed above, the producer is in equilibrium, when the following two conditions are fulfilled.

- (1) The isoquant must be convex at the origin.
- (2) The slope of the Isoquant must be equal to the slope of iso-cost line.

# Optimum combination of innputs

## Diagram

- The I



- Here Q.
- The f units

This is the **optimum output** which the firm can get from the cost outlay of Q.

# Optimum combination of inputs

- In this figure any point below Q on the price line AB is desirable as it shows lower cost, but it is not attainable for producing 400 units of output. As regards points RS above Q on iso-cost lines GH, EF, they show higher cost.
- These are beyond the reach of the producer with CD outlay. Hence point **Q is the least cost point.**
- It is the point which is the least cost factor combination for producing 400 units of output with OC units of factor Y and OD units of factor X.
- Point Q is the **equilibrium of the producer.**
- At this point, the slope of the isoquants equal to the slope of the isocost line. The MRT of the two inputs equals their price ratio.

Thus we find that at point Q, the two conditions of producer's equilibrium in the choice of factor combinations, are satisfied.

(1) The isoquant (IP) is convex at the origin.

(2) At point Q, the slope of the isoquant  $\Delta Y / \Delta X$  (M<sub>TYSxy</sub>) is equal to the slope of the iso-cost in  $P_x / P_y$ .

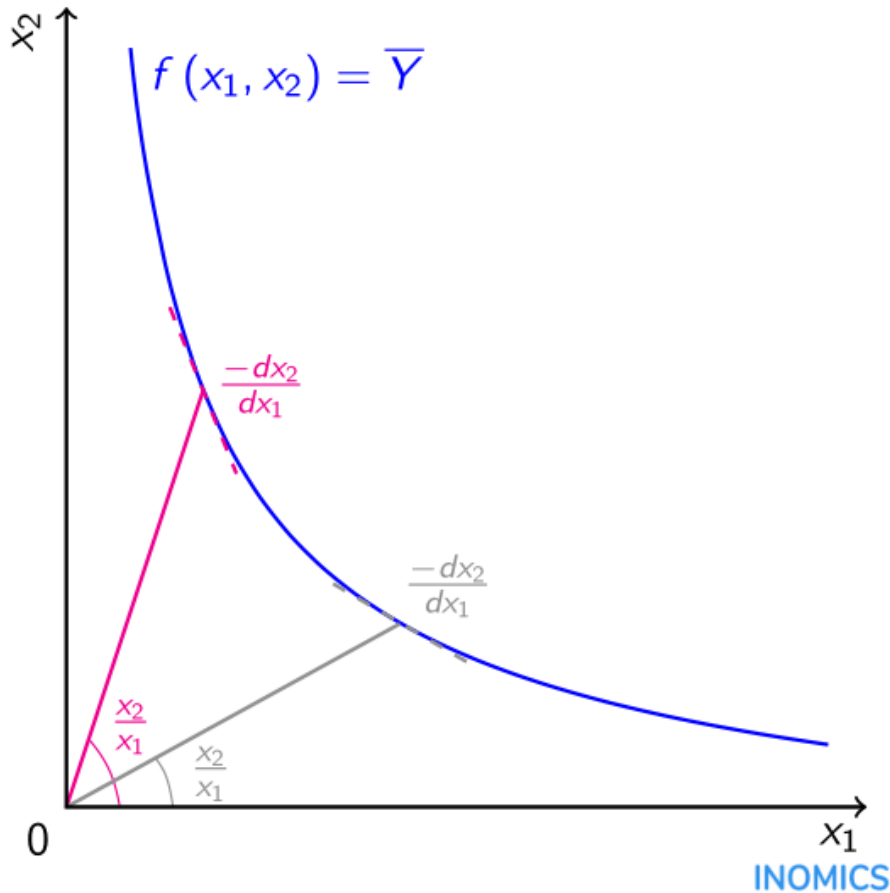
The producer gets the optimum output at least cost factor combination at Q.

# Elasticity of substitutions

- Elasticity of substitution is the **elasticity of the ratio of two inputs to a production (or utility) function with respect to the ratio of their marginal products (or utilities)**.
- In a competitive market, it measures the **percentage change in the two inputs used in response to a percentage change in their prices**.
- Elasticity of substitution measures the **ease with which one can switch between factors of production**.
- It gives a measure of the **curvature of an isoquant**, and thus, the **substitutability between inputs** (or goods), i.e. how easy it is to substitute one input (or good) for the other.
- In order to **calculate** an elasticity of substitution it is first necessary to **determine an isoquant and work out input ratios and marginal rates of technical substitution** along the isoquant.

# Elasticity of substitutions

- An isoquant given by  $f(x_1, x_2) = \bar{Y}$



and  $x_2$  required to produce a given output level  $\bar{Y}$  along the blue isoquant

- For any given point  $(x_1, x_2)$  on the isoquant  $f(x_1, x_2) = \bar{y}$ , **input ratio** is the quantity of one input divided by the other  $x_2/x_1$ .
- For any given point  $(x_1, x_2)$  on the isoquant  $f(x_1, x_2) = \bar{y}$ , the **marginal rate of technical substitution** is  $-dx_2/dx_1$ , which is the **rate at which input  $x_1$  can be exchanged for input  $x_2$**  while maintaining the level of output at  $\bar{y}$ .

# Elasticity of substitutions

- **Elasticity of substitution  $\sigma$**  measures how **easy** it is to **move between points along an isoquant**. When moving between such points there are **changes** in both the **input ratio and the MRTS**.
- Elasticity of substitution is the proportionate changes in the input ratio against proportionate changes in the MRTS.

$$\sigma = \text{Input ratio/MRTS} ; \quad \sigma = \frac{\frac{\Delta(x_2/x_1)}{x_2/x_1}}{\frac{\Delta(-dx_2/dx_1)}{-dx_2/dx_1}} .$$

- A **positive value of  $\sigma$**  indicates a certain **degree of substitutability between production inputs**.
- For the extreme case of **perfect substitutes**, elasticity of substitution approaches **infinity  $\sigma \rightarrow \infty$** . Electricity from two different suppliers could be seen as an example of a perfect substitute: the electricity does the same job of powering production, regardless of the supplier.

# Elasticity of substitutions

- On the other hand, a value of  $\sigma=0$  indicates just the opposite: the **inputs cannot substitute** for each other, indeed they are **perfect complements**; one cannot be employed without also employing the other. For example, in car production, wheels require tyres; neither is sufficient on its own. Thus wheels and tyres are perfect complements.
- The decision about **how to organise production** depends both on the **substitutability of production inputs** (value of  $\sigma$ , shape of isoquants) and on the **relative cost of the inputs to one another**, which can be represented by means of isocost lines.
- For example, if an energy firm produces electricity both through an environmentally friendly source (e.g. wind) and by burning a carbon fuel then how much of each input (wind or carbon fuel) the firm allocates to electricity production will come down to their relative cost.
- If the firm suffers a bad reputation for causing harm to the environment then the **reputational cost could also be internalized** within the production cost, which would make it more likely for the firm to choose or increase its use of the green source.

# Cost Concepts:

- A **production function** tells us **how much output a firm can produce** with its **existing plant and equipment**.
- The level of output depends on **prices and costs**.
- The **most desirable rate of output** is the one that **maximizes total profit** that is the **difference between total revenue and total cost**.
- Entrepreneurs **pay for the input factors**- Wages for labour, price for raw material, rent for building hired, interest for borrowed money. All these costs are included in the **cost of production**.
- The economist's concept of cost of production is different from accounting. Many decisions managers take are based on the cost analysis.

# Cost Concepts:

## Cost Determinants

- 1. Level of output:** The cost of production varies according to the quantum of output.
- 2. Price of input factors:** A **rise in the cost of input** factors will **increase** the total cost of production.
- 3. Productivities of factors of production:** When the **productivity of the input factors is high** then the cost of production will **fall**.
- 4. Size of plant:** The cost of production will be **low in large plants** due to mass production with mechanization.
- 5. Output stability:** The overall cost of production is **low** when the **output is stable** over a period of time.
- 6. Lot size:** **Larger the size of production per batch** then the **cost of production will come down** because the organizations enjoy economies of scale.
- 7. Laws of returns:** The cost of production will **increase** if the **law of diminishing returns** applies in the firm.
- 8. Levels of capacity utilization:** **Higher the capacity utilization, lower** the cost of production

# Cost Concepts:

**9. Time period:** In the long run cost of production will be stable.

**10. Technology:** When the organization follows **advanced technology** in their process then the cost of production will be **low**.

**11. Experience:** over a period of time the experience in production process will help the firm to reduce cost of production.

**12. Process of range of products:** **Higher the range of products** produced, **lower** the cost of production.

**13. Supply chain and logistics:** **Better the logistics and supply chain**, **lower** the cost of production.

**14. Government incentives:** If the **government provides incentives on input factors** then the cost of production will be **low**.

# Types of Costs

- 1. Actual cost/ Outlay cost/ Absolute cost / Accounting cost:** The cost or expenditure which a firm **incurs for producing** or acquiring a good or service. (Eg. Raw material cost). Accounting cost is the recorded cost of a business activity.
- 2. Opportunity cost:** Opportunity cost is the **forgone benefit** that would have been derived by an option not chosen. It is the revenue which could have been earned by employing that good or service in some other alternative uses. (Eg. A land owned by the firm does not pay rent. Thus a rent is an income forgone by not letting it out).
- 3. Sunk cost:** Cost that are retrospective (past) costs that have already been incurred and cannot be recovered.
- 4. Historical cost:** A historical cost is a measure of value used in accounting in which the value of an asset on the balance sheet is recorded at its original cost when acquired by the company.
- 5. Replacement cost:** Replacement cost is a term referring to the amount of money a business must currently spend to replace an essential asset with one of the same or higher value.

# Types of Costs

- 6. Incremental cost:** Incremental cost is the total cost incurred due to an additional unit of product being produced.
- 7. Explicit cost:** Explicit costs are normal business costs that **appear in the general ledger and directly affect** a company's profitability.
- 8. Implicit cost:** An implicit cost is any cost that has **already occurred but not necessarily shown** or reported as a separate expense. It represents an opportunity cost that arises when a company uses internal resources toward a project without any explicit compensation for the utilization of resources.
- 9. Book cost:** Costs which **do not involve any cash payments but a provision is made in the books of accounts** in order to include them in the profit and loss account to take tax advantages.
- 10. Social cost:** **Total cost incurred by the society** on account of production of a good or service.

# Types of Costs

**11. Transaction cost:** Transaction costs are expenses incurred when buying or selling a good or service. Transaction costs represent the labor required to bring a good or service to market, giving rise to entire industries dedicated to facilitating exchanges.

**12. Controllable cost:** Controllable costs are those **costs that can be altered** in the short term. More specifically, a cost is considered to be controllable **if the decision to incur it resides with one person**. Also, if a cost is imposed on an organization by a third party (such as taxes), this cost is not considered to be controllable.

**13. Shut down cost:** The price of a product below which it is cheaper for a company not to make the product than to continue to sell it.

**14. Economic costs:** These are **costs related to future**. They play a vital role in business decisions as the costs considered in decision - making are usually future costs. They are similar in nature to that of **incremental, imputed explicit and opportunity costs**.

# Short-Run Cost Functions

- **Short-run** → some factors of production are **fixed** and others are **variable**.
- **Short-run** → **not defined by** some specified length of time but, by the **variability of factors** of production.
- In the **short-run**, a firm incurs some costs - **variable costs and fixed costs**.
- Long run and short run costs **of every firms varies**.
- **Variable costs (VC)** change as the level of output changes and therefore can be expressed as a function of output (Q), that is  **$VC = f(Q)$** .
- **Fixed cost**- Remains **fixed** irrespective of quantity of production.
- **Variable costs = arises out of production**(**raw material, labor, and utilities.**)

## Managerial Uses of the Short-Run Cost Concepts:

- Total cost is quite in finding out the break-even quantity of output.
- It is also used to find out whether firm is making profits or not.
- The AV is important for calculating the per unit profit of a business firm.
- The marginal and incremental cost concepts are essential to decide whether a firm should expand its production or not.

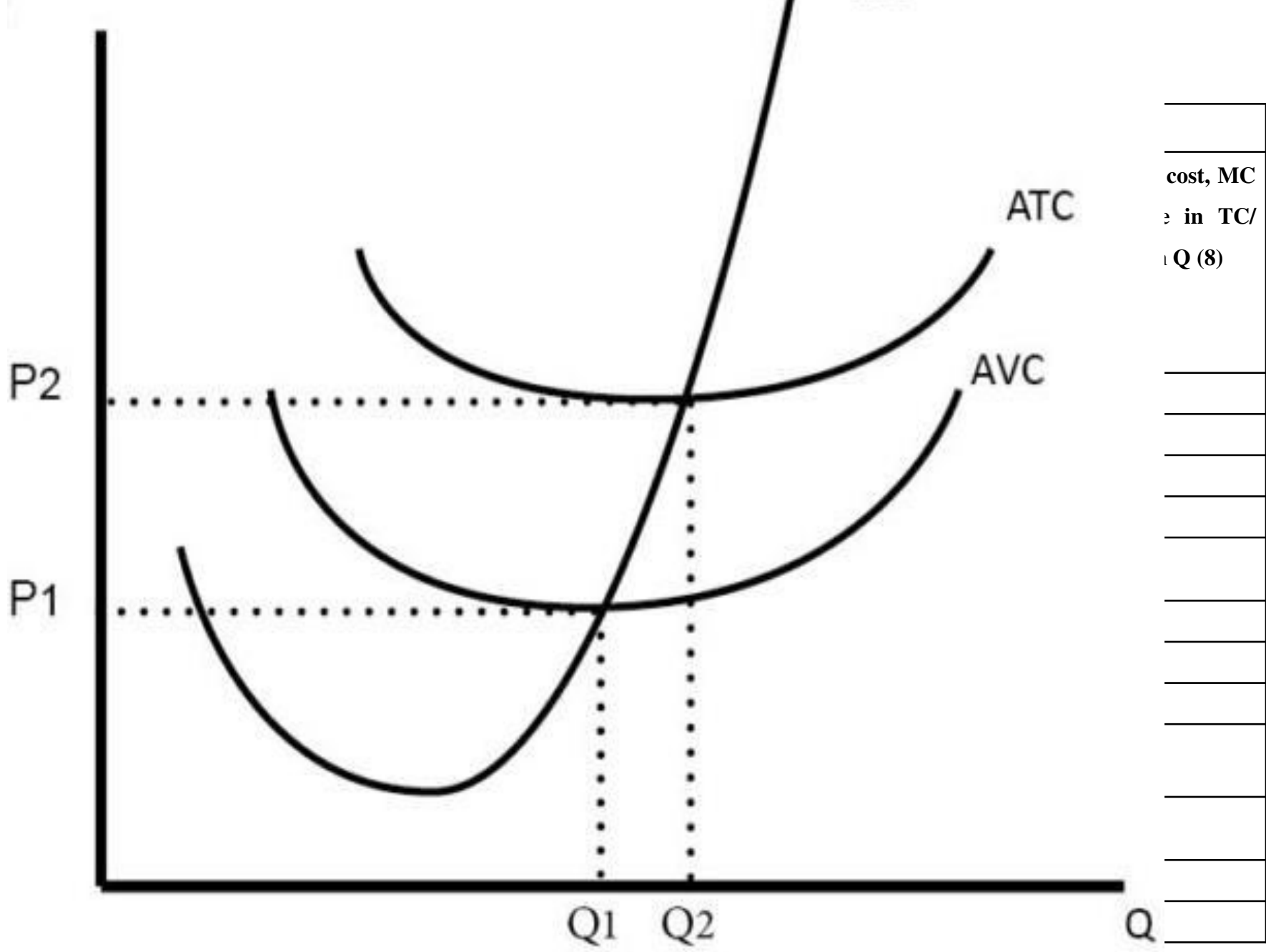
Total cost data, per week				Average-cost data, per week			
Total Product (1)	Total Fixed Cost (TFC) (2)	Total variable cost (TVC) (3)	Total cost (TC) (4) = (2) + (3)	Average fixed cost AFC = TFC/Q (5)	Average variable cost AVC = TVC/Q (6)	Average Total cost ATC = TC/Q (7)	Marginal cost, MC = Change in TC/ Change in Q (8)
0	100	0	100				
1	100	90	190	100.00	90.00	190.00	90
2	100	170	270	50.00	85.00	135.00	80
3	100	240	240	33.33	80.00	113.33	70
4	100	300	400	25.00	75.00	100.00	60
5	100	370	470	20.00	74.00	94.00	70
6	100	450	550	16.67	75.00	91.67	80
7	100	540	640	14.29	77.14	91.43	90
8	100	650	750	12.50	81.25	93.75	110
9	100	780	880	11.11	86.25	97.78	130
10	100	930	1030	10.00	86.67	103.00	150
					93.00		

- **Total Cost:** Fixed + variable cost
- **Per Unit, or Average Costs** = TC/Q
- **Average Fixed Costs** = TFC/Q
- **Average Variable Costs** = TVC/Q

AVC declines initially, reaches a minimum, and then increases again,

- **Average total cost (ATC)** = TC/Q = AFC + AVC

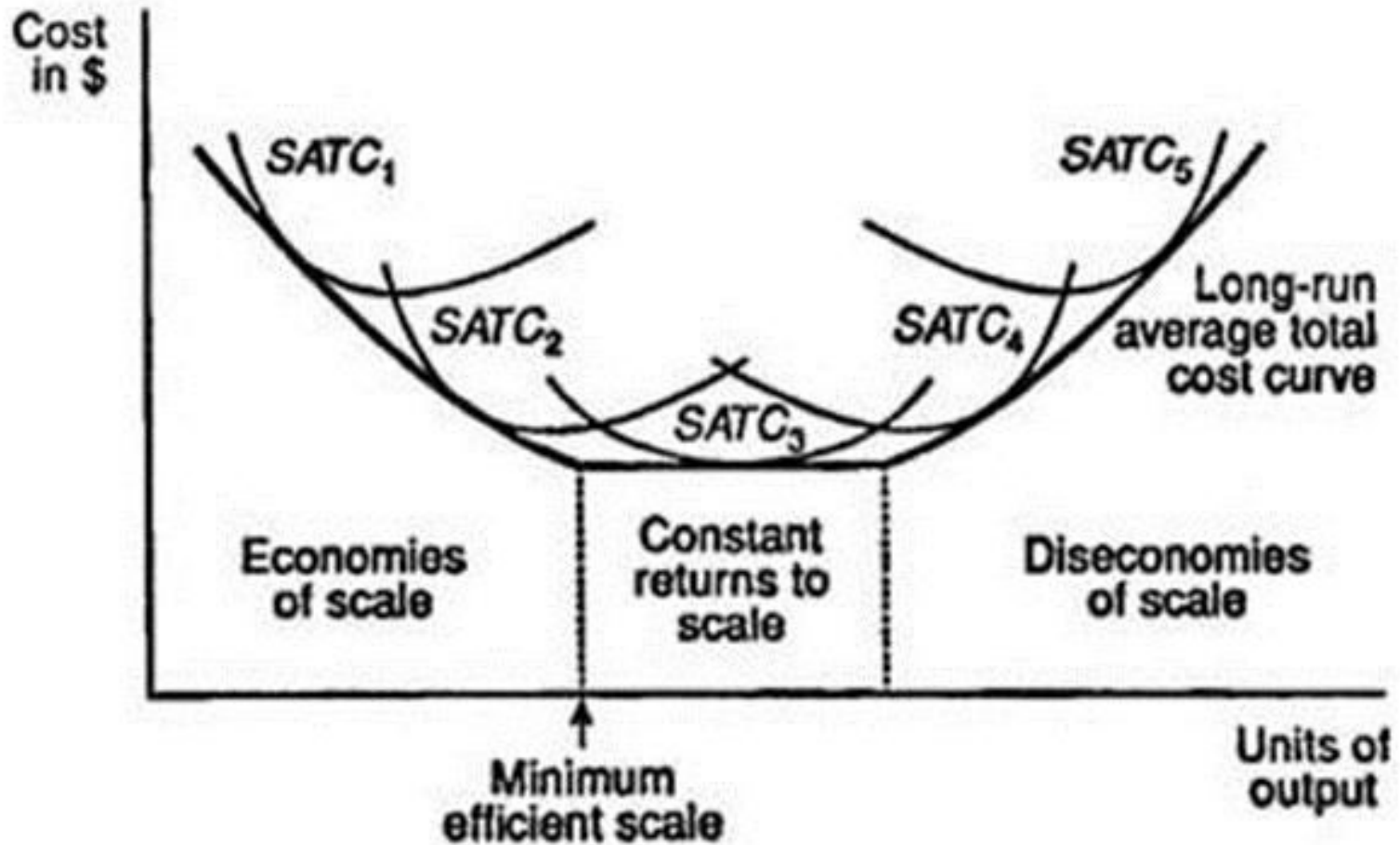
**Marginal Cost** = Change in TC/ Change in Q =  $\Delta TC / \Delta Q$



cost, MC  
 e in TC/  
 Q (8)

COST OF PRODUCTION

# Long-Run Cost Functions



- Long-run average total cost curve is the lower envelope of the short-run average total cost curves.
- Successive short-run average total cost curves are shifted outwards from the origin.
- The short-run average total cost curves are parallel to one another, and the distance between them is constant along the expansion path traced out by A, B, C, D and E.

# Long-Run Cost Functions

## Unit Costs in the Long-Run:

- In the long-run, costs are **not divided** into **fixed and variable** components; all costs are variable.
- Thus, in long-run unit cost functions we have long-run average cost (LAC) and long-run marginal cost (LMC). These are defined as follows:

$$LAC = \frac{LTC}{Q} ; LMC = \frac{\Delta LTC}{\Delta Q} ; LMC = \frac{d(LTC)}{dQ}$$

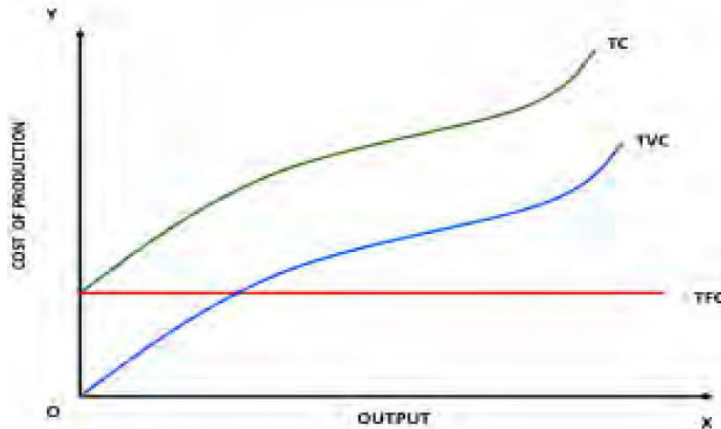
- For the long-run total cost, these unit costs can be presented in tabular form as follows:

Output Q	Long Run Total Cost (LTC)	Long Run Average Cost (LAC)	Long Run Marginal Cost (LMC)
0	0	--	--
50	150	3.00	3.00
125	200	1.60	0.67
250	250	1.00	0.67
300	300	1.00	1.00
325	350	1.08	2.00

# Inter-relationship of cost:

## Short Run Cost Output Relationship:

Graph – Total Cost Curves

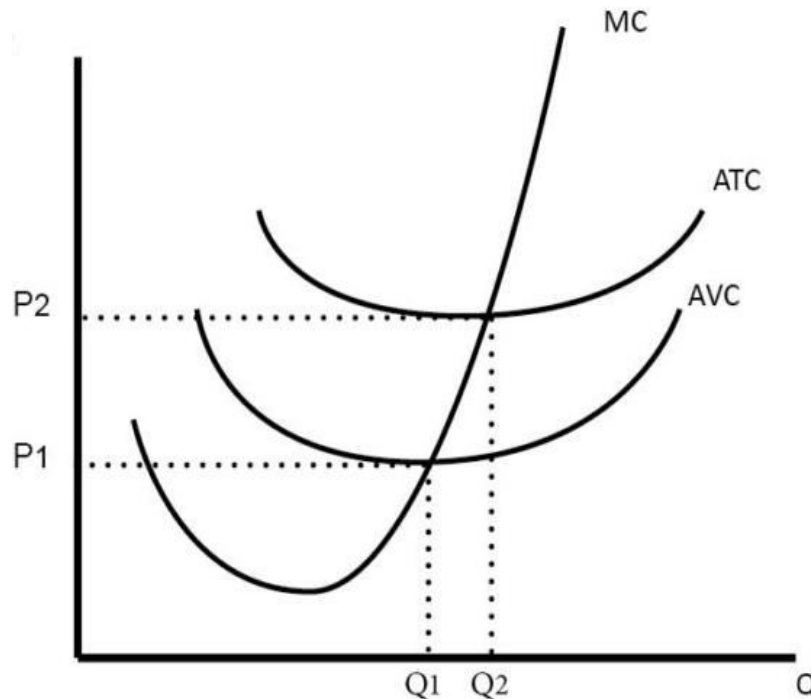


- Total fixed costs as a horizontal straight line because the FC remains constant at all levels of output.
- The curves TC and TVC are parallel to each other. The vertical distance between them is as same as TFC.
- As output increases the average cost decreases until maximum capacity of the equipment and scale used in the factory.
- If production is pushed beyond this level, without changing the equipment and scale, difficulties will arise leading to diminishing returns or increasing costs .

# Short-Run Cost Functions

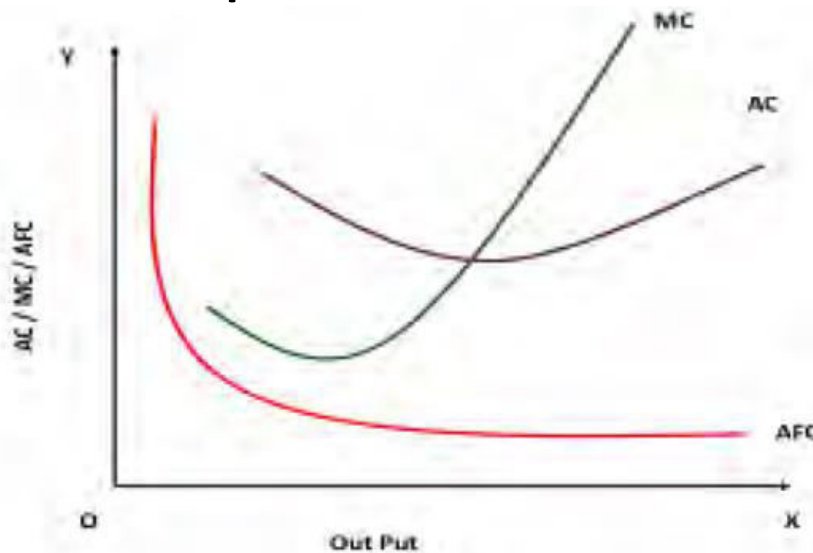
## Relationship of MC to AVC and ATC:

- Marginal cost cuts both AVC and ATC at their minimum when both the MC and AVC are falling.
- When MC and AVC are both rising, MC will rise at a faster rate. As a result, MC will attain its minimum before the AVC.
- When MC is less than AVC, the AVC will fall, and when MC exceeds AVC, AVC will rise.
- At the point of intersection where  $MC=AVC$ , AVC has attained its minimum.
- However, no such relationship exists between MC and the average fixed cost.



# Inter-relationship of cost:

## Short Run Cost Output Relationship:



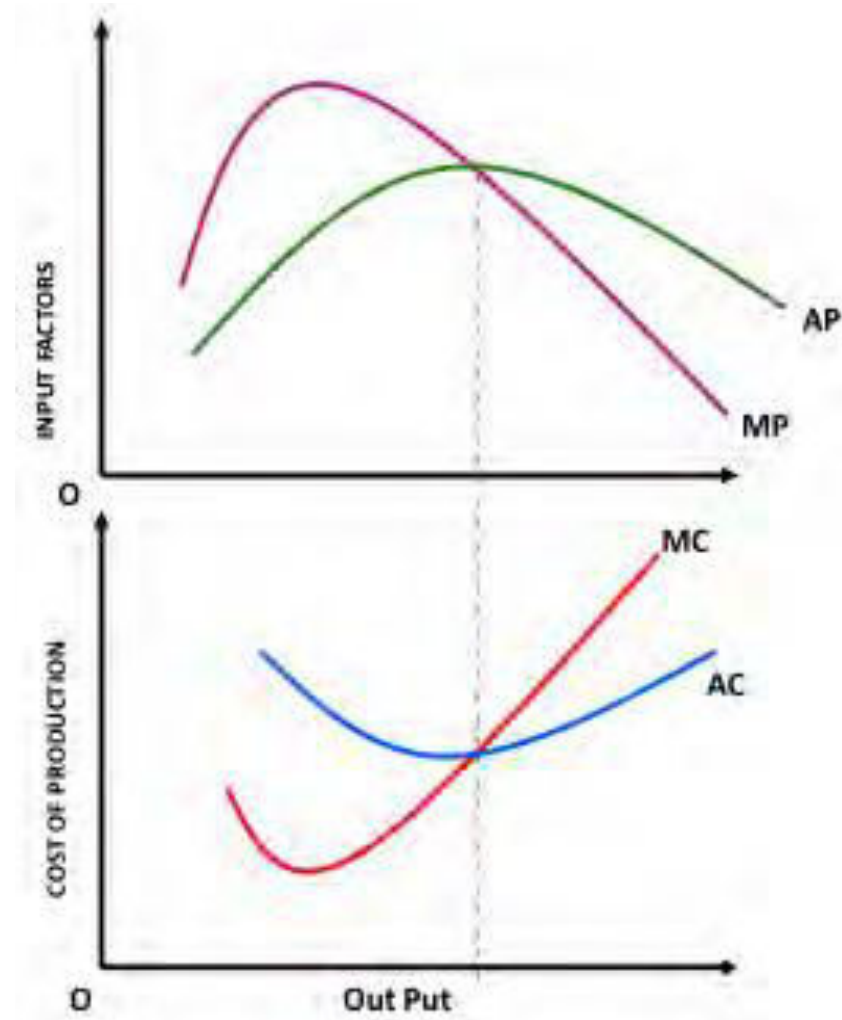
- AFC curve declines as output increases and then remains almost constant as output increases.
- The MC curve slopes like a tick mark which declines up to an extent then it starts increasing along with the output.
- The AC curves is U shaped because of law of diminishing returns.
- The MC curve cuts the AC curve and AVC curves from below, at their lowest point.
- The AC curve is above the MC curve when AC is falling. The AC curve is below the MC when AC is increasing.
- The intersecting point indicates that **AC=MC** and that is the **minimum average cost with an optimum output.**

# Inter-relationship of cost:

## Short Run Cost Output Relationship:

### Optimum Output and Minimum Cost

- All organizations aim for **maximum(optimum) output with minimum(average) cost.**
- The **MP=AP** at maximum average production.
- At **MC = AC** at minimum average variable cost.



$L_0$

$Q_1$

0

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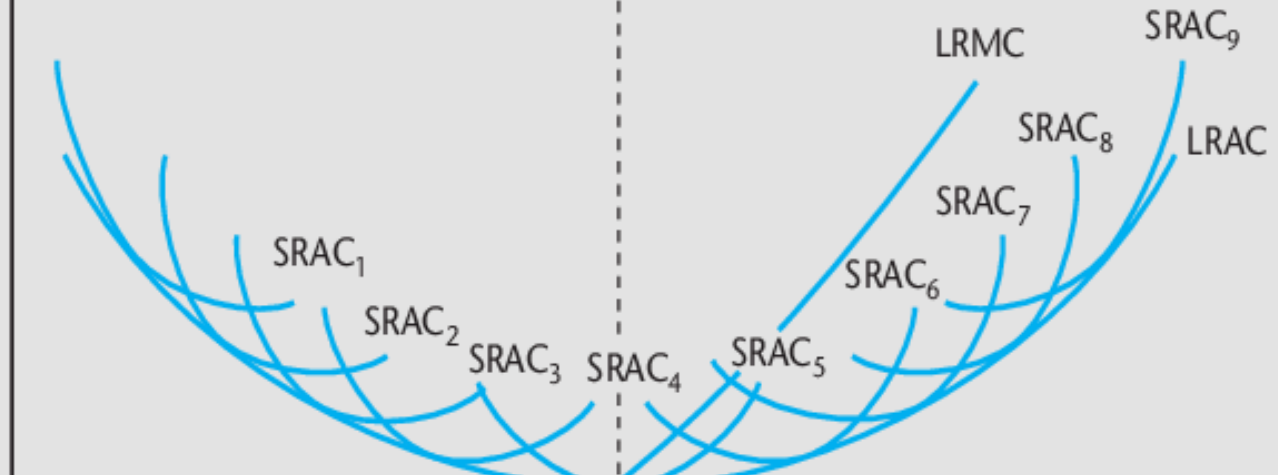
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Short-run average cost (SRAC)  
Long-run average cost (LRAC)  
Long-run marginal cost (LRMC)

Increasing returns to scale

Decreasing returns to scale



0

$Q_1$

Minimum efficient scale (MES)

Output per unit of time

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# Cost control:

- **Institute of Cost and Management Accountants, London**, defines ‘**cost control**’ as “the **guidance and regulation** by executive action of the costs of operating an undertaking, particularly where such action is guided by cost accounting.”
- **Cost control** is achieved by **fixing standards of performance**, **collecting actual cost data** for each area of responsibility, **comparing actual data with standards** and **forwarding prompt report** to top management **highlighting the deviations from standards** from **immediate corrective action**. Thus, cost control compels actual costs to conform to planned costs.

## Features of Cost Control:

### a. Existence of Cost Accounting:

- The cost control system can be introduced only if cost accounting practices are designed to suit the undertaking.
- The cost accounting system so installed, accomplishes one of the twin objectives of cost accounting, viz., **cost ascertainment and cost control**.

# Cost control:

## b. Predetermined Standards:

- Another requirement of cost control is the **fixation of attainable targets of performance**.
- The targets set, should be scientific, taking into consideration all practical aspects governing production as well as the related costs.

## c. Cost Reporting:

- **Executive action for cost control** should be **guided by cost accounting**.
- There should be an **effective system of reporting** cost information.
- The reports **should point significant deviations** from the predetermined targets, and not merely historical costs.
- Cost reporting is to be accomplished at the appropriate time and not when it is too late to do anything.

## d. Corrective Action:

- **Action should also be taken** to see that significant deviations which are now corrected by executive action are not allowed to appear all over again.
- In other words, corrective action should **be to prevent the recurrence of deviations**.

# Cost reduction:

- Cost reduction is “the **achievement of real and permanent reduction** in the **unit cost** of goods manufactured or services rendered **without impairing their suitability for use intended.**” CIMA (England).

Cost reduction may be effected in two ways-

- (i) by reducing the cost per unit; and
- (ii) by increasing productivity. Cost reduction has to be effected within the organisation.

## Features of Cost Reduction:

### (a) Reduction in Unit Costs:

- The aim of cost reduction is to bring down the cost per unit of a commodity or service.
- Unit cost may come down if the prices of input factors also come down. But, the prices of inputs will rise owing to limited supply for natural causes. Consequently, cost per unit of the finished product also rises.
- What is therefore, needed is a change in the methods of production, new design, increase in productivity, new standards, etc.

# Cost reduction:

## (b) Reduction to be Permanent:

- Reduction In unit cost should not only be real but permanent also.
- A temporary reduction in the unit cost has no significance if, in the near future, cost per unit goes up for whatever reason.

## (c) Use Value to be Unaffected:

- Any article, produced with the available scarce resources has not only exchange value but use value also.
- Its **exchange value** is dependent upon **market forces**.
- However its **use value** depends entirely upon its **quality**.
- If, therefore, an article is to be put to the intended use, **its quality should be good enough**.
- Cost reduction should not be at the expense of its quality.
- Any **cost reduction should not impair or affect the suitability** of the article for the intended use.



thank  
you

A thick black L-shaped frame is positioned on the left and bottom edges of the slide, framing the text.

# DETERMINATION OF PRICE AND OUTPUT

## MODULE 4

# MODULE 4

## DETERMINATION OF PRICE AND OUTPUT

- Concept of Market equilibrium and Revenue curves
- Characteristics of different market structures
- Price determination and firms equilibrium under perfect competition
- Price determination and firms equilibrium under monopolistic competition
- Price determination and firms equilibrium under oligopoly and
- Price determination and firms equilibrium under monopoly
- Price discrimination
- International price discrimination and dumping
- pricing methods

# Market equilibrium

- **Market equilibrium** refers to the stage where the **quantity demanded for a product is equal to the quantity supplied for the product.**
- It is the state in which market supply and demand balance each other, and as a result **prices become stable.** This is called **equilibrium price.**
- When the market is in **equilibrium**, there is **no tendency for prices to change.** We say the **market-clearing price** has been achieved
- Over-supply of goods or services causes prices to go down, which results in higher demand—while an under-supply or shortage causes prices to go up resulting in less demand. The balancing effect of supply and demand results in a state of equilibrium.
- **Equilibrium price (market clearing price)-price when there is neither an unsold stock nor an unsupplied demand.**

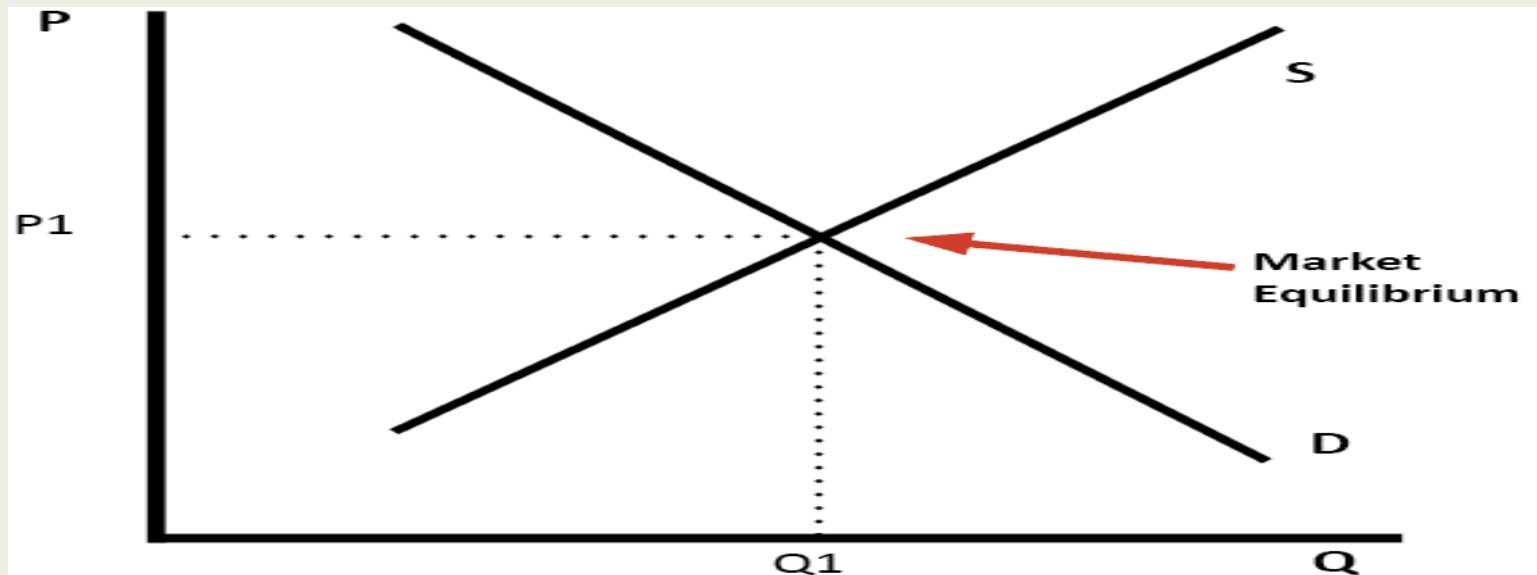
# Market equilibrium

Price per unit of commodity (Rs)	Quantity demanded per week (units)	Quantity supplied per week (Units)
10	500	100
20	400	200
30	300	300
40	200	400
50	100	500

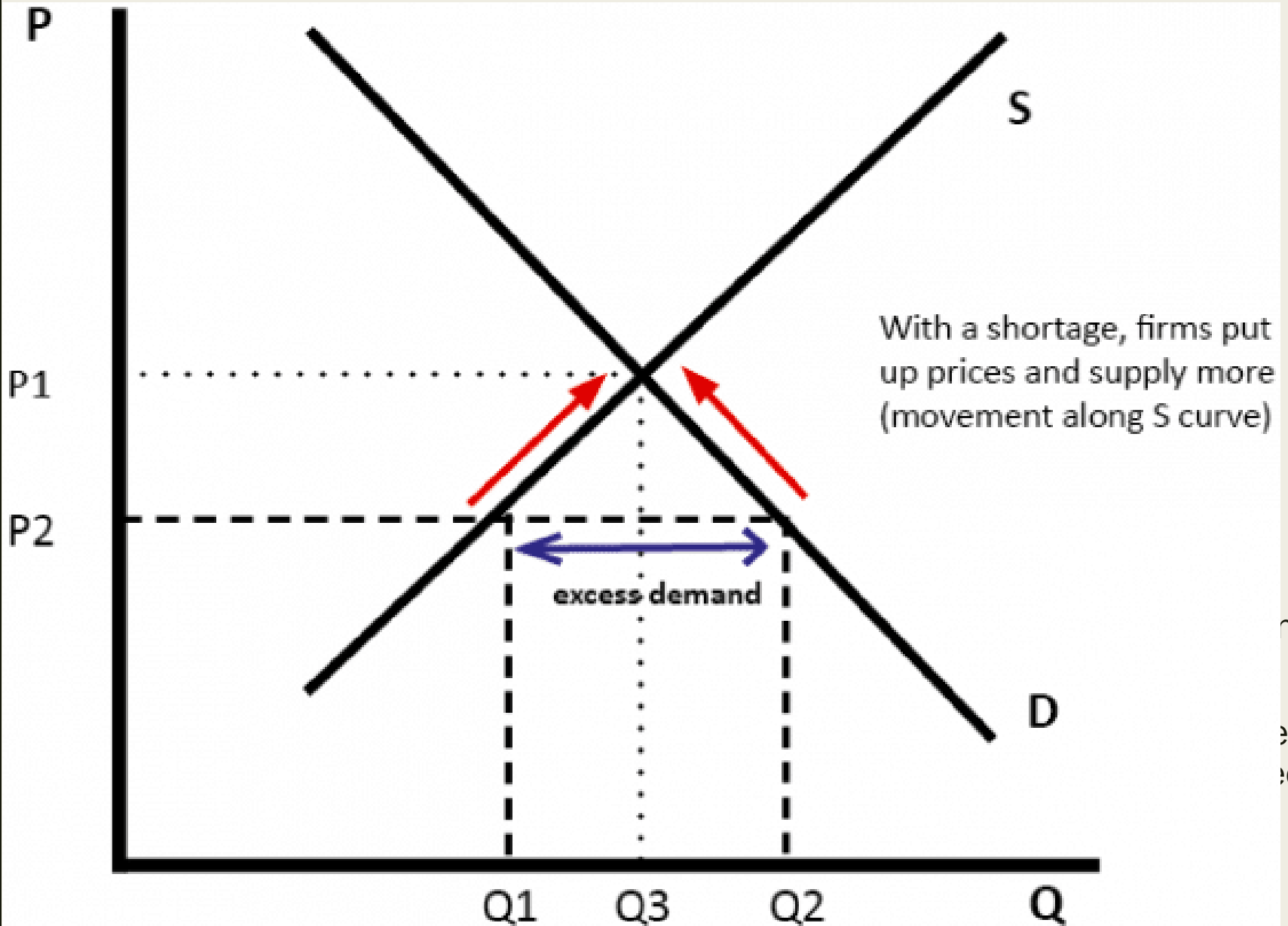
- The process of increase in prices goes on till the price of talcum powder reaches to Rs. 30. At this price, the demand and supply is equal to 300. Therefore, equilibrium is achieved and the **equilibrium price is Rs. 30.**

# Market equilibrium

- Similarly, if the supply of talcum powder increases beyond 300, then the sellers need to decrease their prices to sell their unsold stock.
- They would also stop production that results in the decrease in supply.
- In such a case, consumers would buy more due to reduction in price of talcum powder. This would continue till the stock would achieve equilibrium and the equilibrium price come out to be Rs. 30.
- In the diagram below, the equilibrium price is  $P_1$ . The equilibrium quantity is  $Q_1$ .



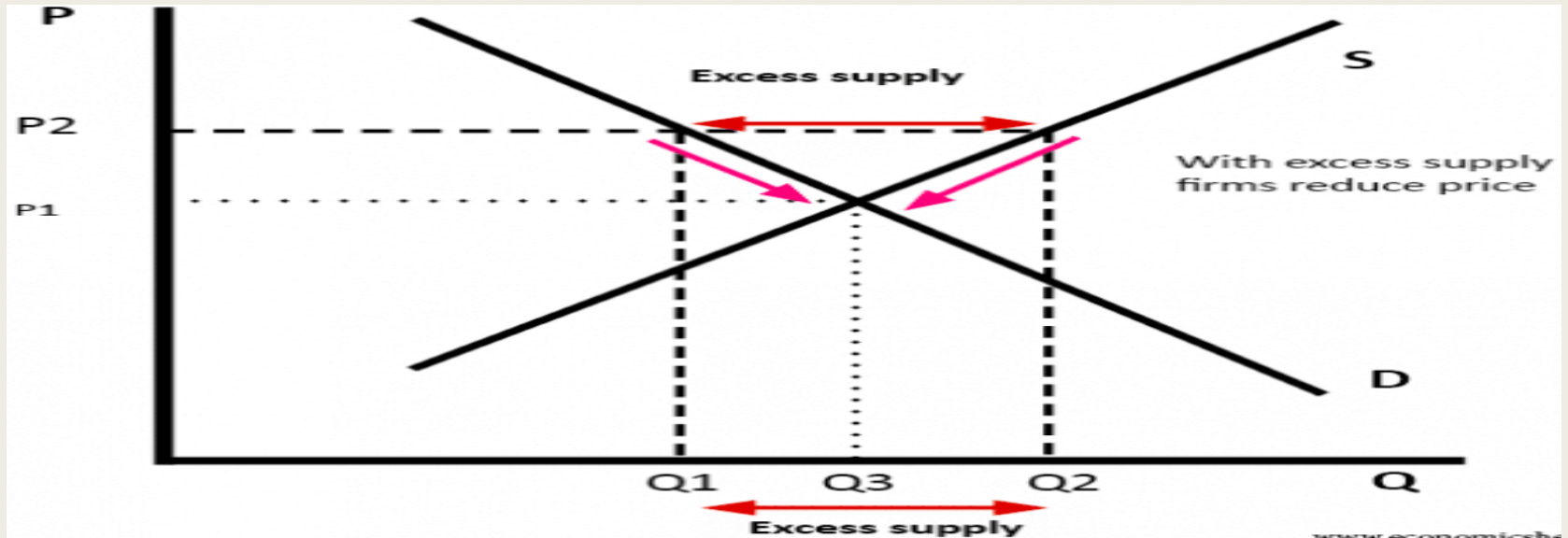
# Market equilibrium



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# Market equilibrium

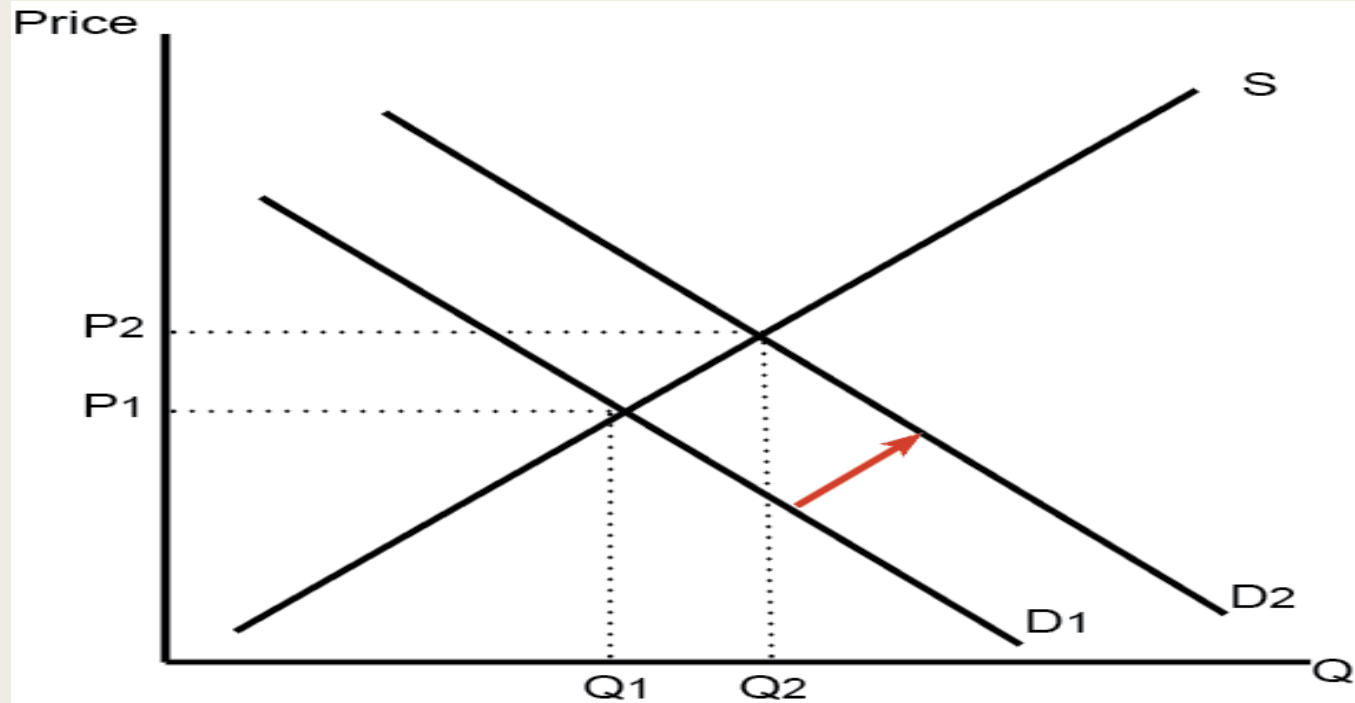
- If price is above the equilibrium



- If price was at  $P_2$ , this is above the equilibrium of  $P_1$ . At the price of  $P_2$ , then supply ( $Q_2$ ) would be greater than demand ( $Q_1$ ) and therefore there is too much supply. There is a surplus. ( $Q_2 - Q_1$ )
- Therefore firms would reduce price and supply less. This would encourage more demand and therefore the surplus will be eliminated. The new market equilibrium will be at  $Q_3$  and  $P_1$ .

# Movements to a new equilibrium

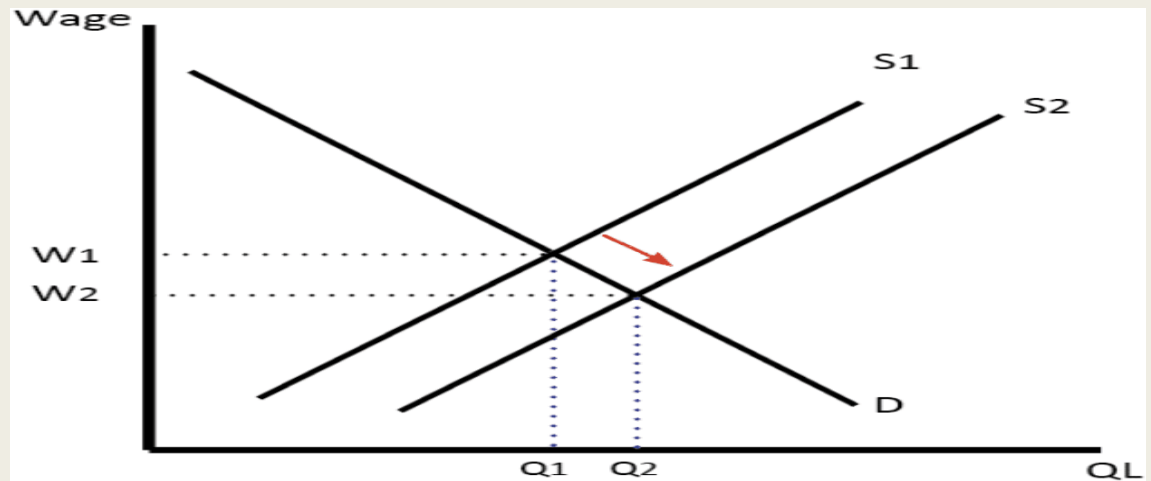
## 1. Increase in demand



- If there was an increase in income the demand curve would shift to the right (D1 to D2).
- Initially, there would be a **shortage of the good**. Therefore the **price and quantity supplied will increase** leading to a new equilibrium at Q2, P2.

# Movements to a new equilibrium

## 2. Increase in supply



- An increase in supply would lead to a **lower price and more quantity sold**.

## Revenue schedule

- A revenue schedule shows the amount of revenue generated by a firm at different prices.

<i>P</i> (Price) £	<i>Q</i> (Quantity)	<i>TR</i>	<i>MR</i> £	<i>AR</i> £
6	0	0	—	—
5	1	5	5	5
4	2	8	3	4
3	3	9	1	3
2	4	8	-1	2
1	5	5	-3	1

# Characteristics of different market structures

- **Market structure**, in economics, refers to how **different industries are classified and differentiated** based on their **degree and nature of competition for goods and services**.
- Some of the factors that determine a market structure include the **number of buyers and sellers, ability to negotiate, degree of concentration, degree of differentiation of products, and the ease or difficulty of entering and exiting the market**.

It is common to differentiate these markets across the following seven distinct features.

1. The industry's buyer structure
  2. The turnover of customers
  3. The extent of product differentiation
  4. The nature of costs of inputs
  5. The number of players in the market
  6. Vertical integration extent in the same industry
  7. The largest player's market share
- Based on the above features, economists have described four distinct types of market structures. They include **perfect competition, oligopoly market, monopoly market, and monopolistic competition**.

# Perfect competition

- **Perfect competition** occurs when there is a **large number of small companies competing** against each other.
- They sell similar products (homogeneous), lack price influence over the commodities, and are free to enter or exit the market.
- Consumers in this type of market have full knowledge of the goods being sold. They are aware of the prices charged on them and the product branding.

**A perfectly competitive market has several important characteristics:**

1. No individual firm possesses a **substantial market share**.
2. The industry output is a **standardized product**(standardized products are homogenous, a single producer **cannot increase the price** of their good or service without losing all sales to the competition. It implies that **price-taking firms face perfect price-elasticity of demand**).
3. Freedom of entry and exit.

# Oligopoly competition

- Oligopoly market consists of a small number of large companies that **sell differentiated or identical products**.
- Since there are few players in the market, their **competitive strategies** determines their survival.
- Under oligopoly a major policy change on the part of a firm is likely to have immediate effects on other firms in the industry. Therefore, the rival firms remain all the time vigilant about the moves of the firm which takes initiative and makes policy changes.

Characteristics are discussed as follows:

## 1. Interdependence:

2. **Advertising** (A firm under oligopoly can start an aggressive advertising campaign and other firms in the industry will obviously resist its defensive advertising).

3. **Group Behavior** (Each firm knows that its actions will have some effect on other firms in the group).

4. **Competition**(Move by one seller immediately affects the rivals).

# Oligopoly competition

## 5. Barriers to Entry of Firms:

There are **no barriers** to entry into or exit. However, in the long-run, there are some types of barriers to entry which tend to restrain new firms from entering the industry.

When entry is restricted or blocked by such natural and artificial barriers the oligopolistic industry can **earn long-run supernormal profits**.

**6. Lack of Uniformity**(Some may be small, others very large).

**7. Existence of Price Rigidity:** Each firm has to stick to its price. If any firm tries to reduce its price, the rival firms will retaliate by a higher reduction in their prices. This will lead to price war which benefits none. If any firm increases its price with a view to increase its profits; the other rival firms will not follow the same. Hence, no firm would like to reduce the price or to increase the price. The price rigidity will take place.

## 7. No Unique Pattern of Pricing Behavior:

Each firm wants to remain independent and to get the maximum possible profit. Towards this end, they act and react on the price-output movements of one another .

On the other hand, again motivated by profit maximization each seller wishes to cooperate with his rivals to reduce or eliminate the element of uncertainty. All rivals enter into tacit or formal agreement with regard to price-output changes.

It leads to a sort of monopoly within oligopoly. They may even recognize one seller as a leader at whose initiative all the other sellers raise or lower the price.

# Monopoly competition

- In a **monopoly** market, a **single company** represents the whole industry.
- It has no competitor, and it is the sole seller of products in the entire market.
- Sole claim to ownership of resources, patent and copyright, licenses issued by the government, or high initial setup costs are the factors causing monopoly.

Features of monopoly are:

1. **One Seller and Large Number of Buyers**
2. **No Close Substitutes**
3. **Difficulty of Entry of New Firms**
4. **Monopoly is also an Industry**
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.**

# Monopolist competition

- Monopolistic competition refers to an imperfectly competitive market with the traits of both the **monopoly and competitive market**.
- Sellers **compete** among themselves and can **differentiate their goods in terms of quality and branding to look different**.
- In this type of competition, **sellers consider the price charged by their competitors** and ignore the impact of their own prices on their competition.
- In the short term, the monopolistic company maximizes its profits and enjoys all the benefits as a monopoly.

The following are the characteristics of a monopolistic market:

## 1. Single supplier

- A monopolistic market is regulated by a single supplier.

## 2. Barriers to entry and exit

## 3. Profit maximizer

- In a monopolistic market, the company maximizes profits. It can set prices higher than they would've been in a competitive market and earn higher profits.

## 4. Unique product

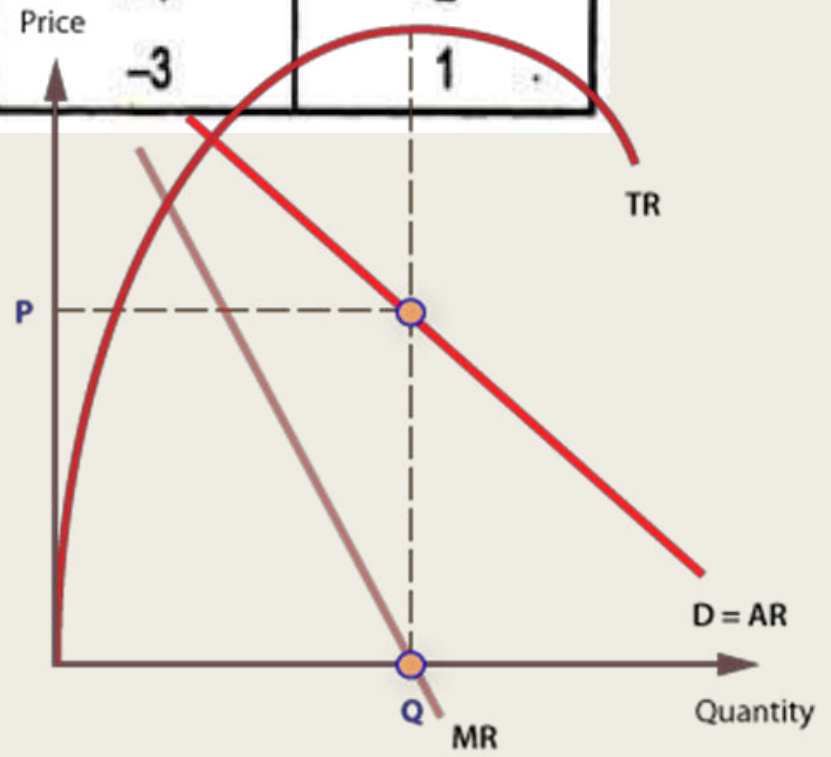
## 5. Price discrimination

- Considering that the market is elastic, the company will sell a higher quantity of the product if the price is low and will sell a lesser quantity if the price is high.

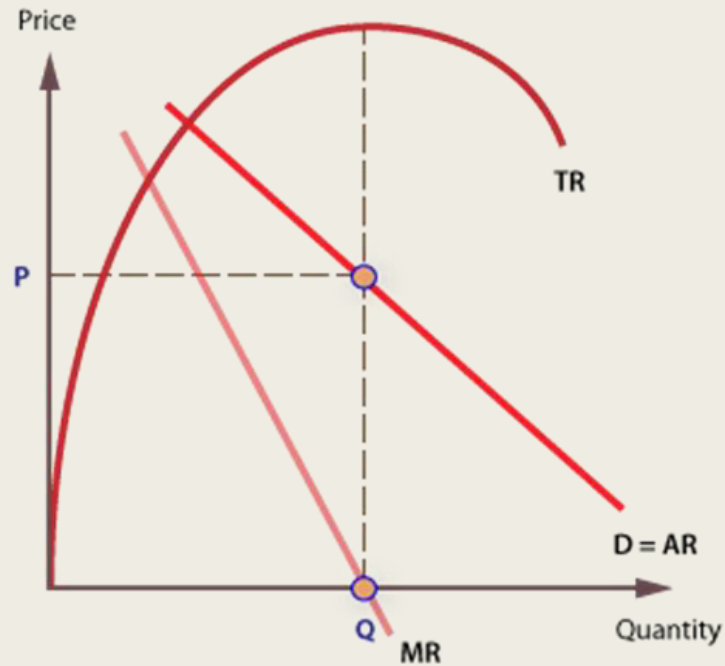
**Table 9.1 : TR, MR and AR, P and Q**

<b>P (Price)</b> £	<b>Q (Quantity)</b>	<b>TR</b>	<b>MR</b> £	<b>AR</b> £
6	0	0	—	—
5	1	5	5	5
4	2	8	3	4
3	3	9	1	3
2	4	8	-1	2
1	5	5	-3	1

at different



# Revenue curves:



- Initially, as output increases total revenue (TR) also increases, but at a decreasing rate. It eventually reaches a maximum and then decreases with further output. Less competition in a given market is likely to lead to higher prices and the possibility of higher super-normal profits.
- However, as output increases the average revenue (AR) curve slopes downwards. The AR curve is also the firm's demand curve.
- The marginal revenue (MR) curve also slopes downwards, but at twice the rate of AR. This means that when MR is 0, TR will be at its maximum. Increases in output beyond the point where  $MR = 0$  will lead to a negative MR.

# Revenue curves:

## (i) Revenue Curve under Perfect competition:

- **Perfect competition** is the term applied to a situation in which the individual buyer or seller (firm) represent such a small share of the total business transacted in the market that he exerts no perceptible influence on the price of the commodity in which he deals.
- Thus, in perfect competition an individual firm is **price taker**, because the **price is determined** by the collective forces of **market demand and supply** which are not influenced by the individual.
- When price is the same for all units of a commodity, naturally AR (Price) will be

Table 5

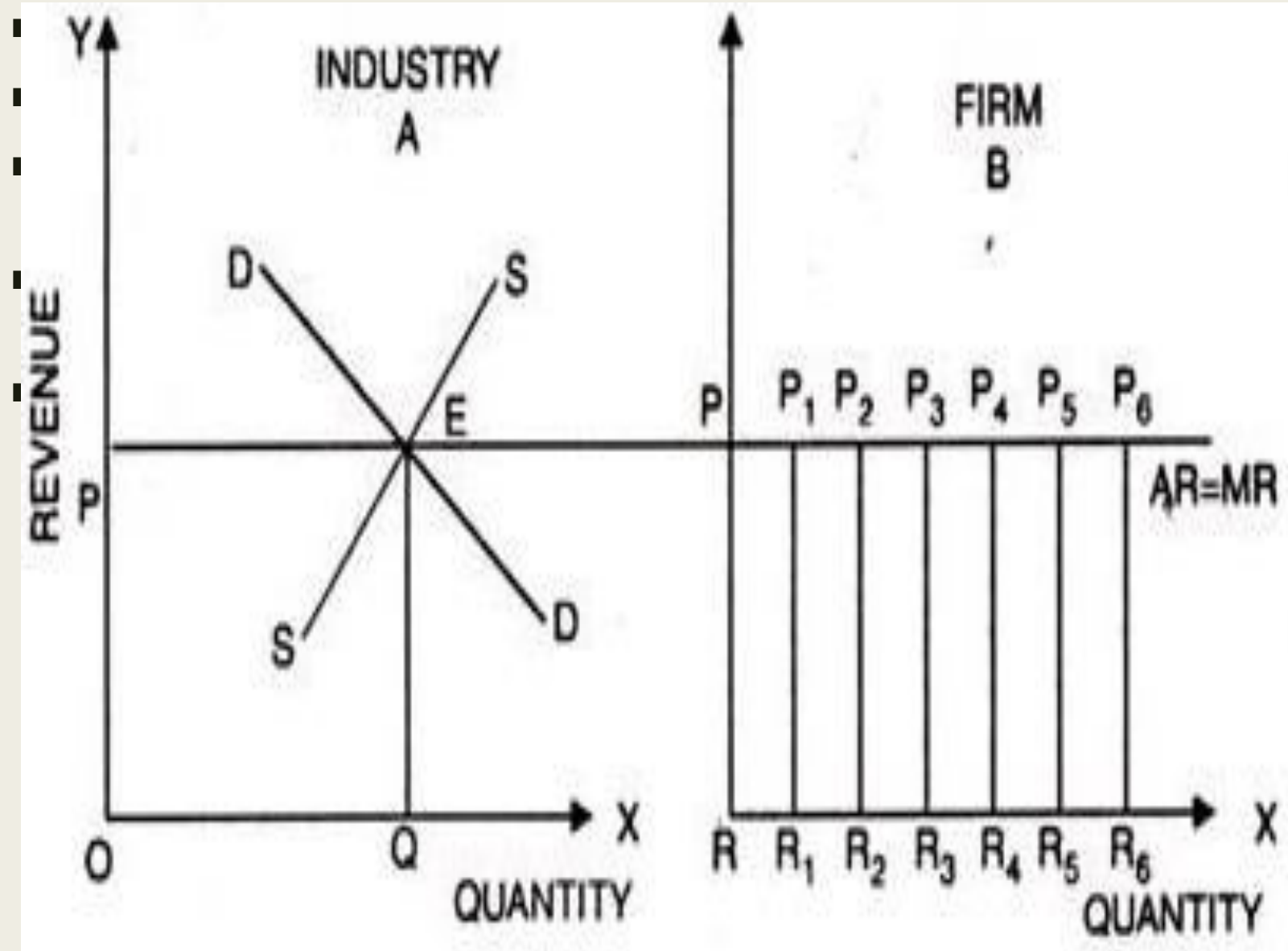
Units	TR	AR	MR
1	5	5	5
2	10	5	5
3	15	5	5
4	20	5	5
5	25	5	5

- In table 5 we find that as output increases, AR remains the same i.e. Rs. 5. Total revenue increases but at a constant rate. Marginal revenue is also constant i.e. Rs. 5 and is equal to AR.

Thus,  $TR = AR \times Q$ . Also,  $TR = MR \times Q$  [Since  $AR = MR$ ]

# Revenue curves:

(i) Revenue Curve under Perfect competition:



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Marginal

case AR

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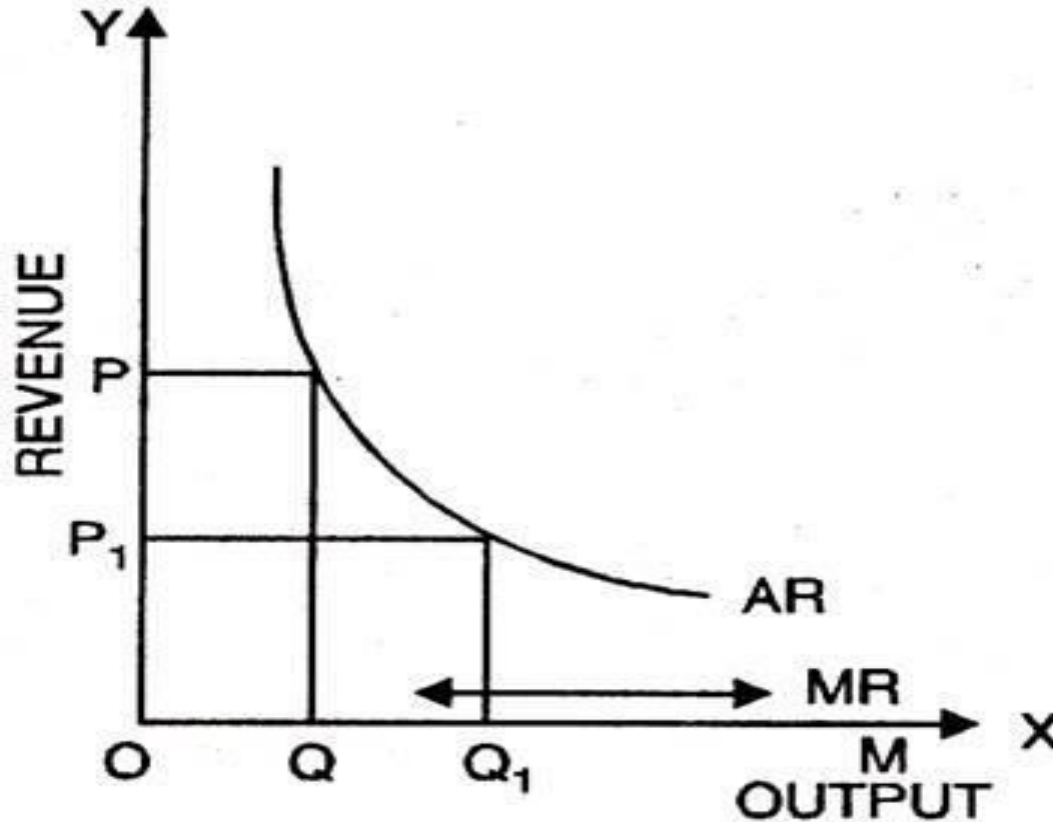
(ii) Revenue

- Under more

Unit sold	Price Rs.	TR	AR	MR
5	4	20	4	—
10	2	20	2	0
20	1	20	1	0
40	0.50	20	0.50	0
50	0.40	20	0.40	0

that to sell

- In case of p shown in Fig
- It implies the Area below e MR curve wil
- In this situat prices, he commodity.



ola as has been  
 may be the price.  
 en TR is constant  
 are .  
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 the concerned

# Revenue curves:

## (iii) Revenue Curve under Imperfect Competition:

- Under monopoly or imperfect competition, demand curve or AR curve is less than perfectly elastic, the exact degree of elasticity being different in different market situations depending upon the number of sellers and the nature of product.
- In other words, the **demand/AR curve** has a **negative slope** and the **MR curve** lies

a lower

bringing

Price	Units Sold	TR	AR	MR
6	1	6	6	6
5	2	10	5	4
4	3	12	4	2
3	4	12	3	0
2	5	10	2	-2

- In table , 2 units can be sold at a unit price of Rs. 5, bringing in TR of Rs. 10. When 3 units are sold, the price per unit is lowered to Rs. 4 to make it possible for larger quantity to be sold. The TR in this case is Rs. 12.
- The marginal unit is not bringing in Rs. 4 which is its price, but only Rs. 2. This is because the additional one unit is sold at Re. one less and the first 2 units which could have been sold for Rs. 5 are also sold at Rs. 4. i.e., Re. one less.

# Revenue curves:

## (iii) Revenue Curve under Imperfect Competition:

Fig. 10, A shows that as **additional units are sold when price comes down** not only for the marginal units but also for other previous units. As a result, marginal units do not bring revenue equal to its price.

In fig. 10 B. TR increases at a diminishing rate, becomes maximum at point N and then

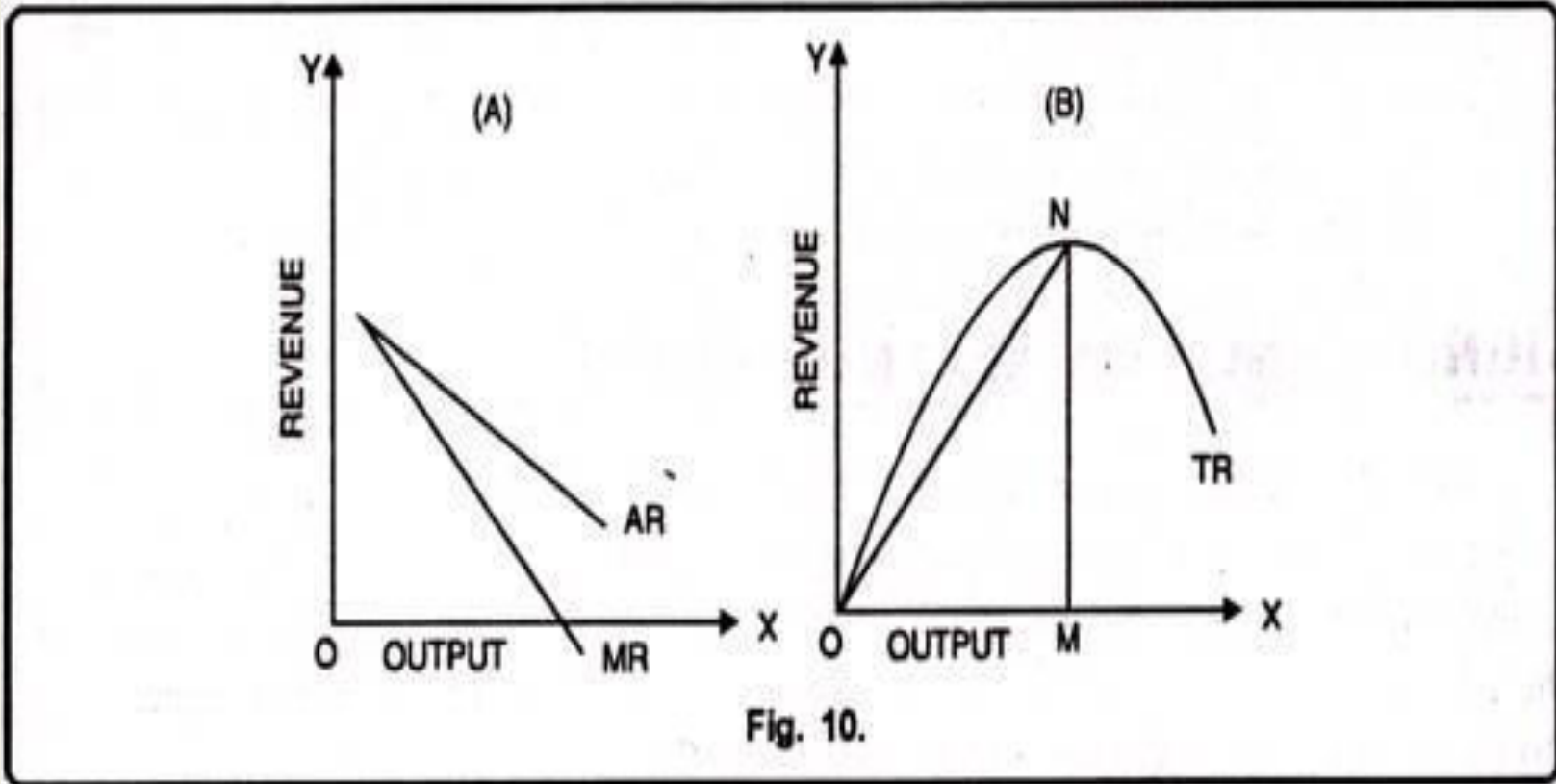


Fig. 10.

$$ON = \frac{NM}{OM} = \frac{TR}{\text{output}}$$

point to  
e.

# Revenue curves:

## (iv) Revenue Curves under Oligopoly:

- Under oligopoly market ,the number of sellers are small.
- The price reduction or extends
- If a seller raises the price of I by following the same price, raised the price, is likely to su

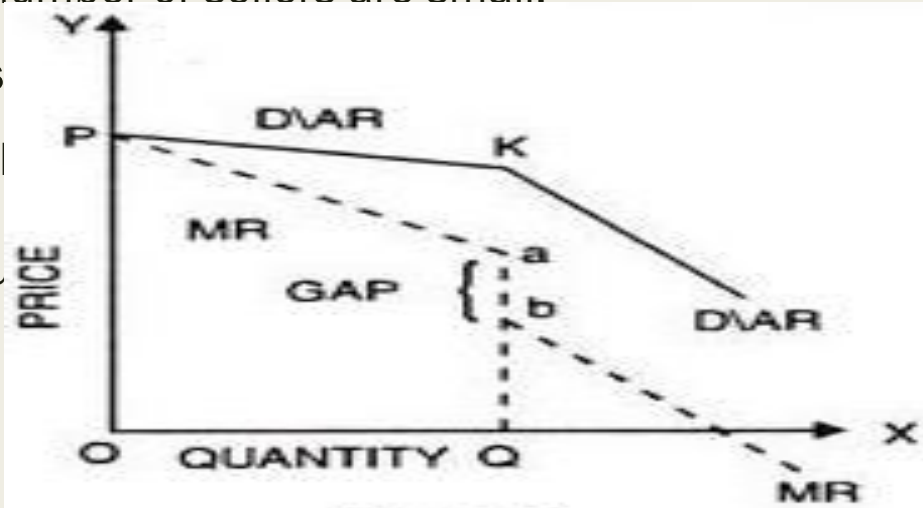


Fig. 12.

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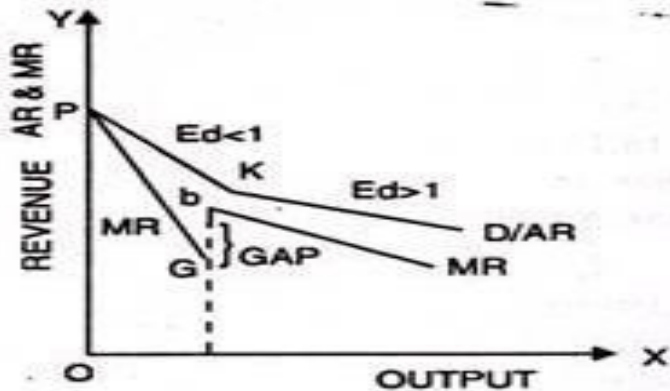


Fig. 11, the AR curve becomes highly elastic after K. MR, corresponding to AR curve rises that it again takes its course at a new higher level.

# Price Determination under Perfect Competition

- Perfect competition is defined as a market situation where there are a **large number of sellers of a homogeneous product**.
- An **individual firm** supplies a very small portion of the total output and is **not powerful enough to exert an influence on the market price**.
- A single buyer, however large, is not in a position to influence the market price.
- **Market price in a perfectly competitive market** is determined by the **interaction of the forces of market demand and market supply**.
- **Market demand** means the **sum of the quantity demanded by individual buyers at different prices**.
- Similarly, **market supply** is the **sum of quantity supplied by the individual firms** in the industry.
- Each seller and buyer takes the price as determined. Therefore, in a perfectly competitive market, the **main problem for a profit-maximizing firm** is not to determine the price of its product but to **adjust its output to the market price** so that profit is maximized.

Price determination under perfect competition is analyzed under three different time periods:

(a) Market Period

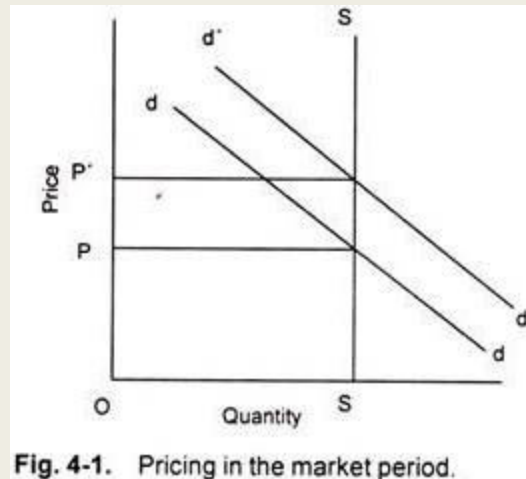
(b) Short Run

(c) Long Run

# Price Determination under Perfect Competition

## (a) Market Period:

- The market period is a **very short period**(may be an hour, a day or a few days or even a few weeks) in which the **supply of a commodity is fixed**.
- For example, in the case of perishable commodities like vegetables, fish, eggs, the period may be a day.
- It is the **variations in demand** that determine the **price** in such a market period. The time period is so short that supply is not responsive to demand.



- Fig 4.1 ,supply curve of perishable commodities like fish, vertical straight line SS is perfectly inelastic. dd is the demand curve. Demand curve and supply curve intersect each other at point R, determining the price OP. If the demand for fish increases suddenly, shifting the demand curve upwards to d'd'.
- The equilibrium point shift from R to R'' and the price rises to OP'. In this situation, **price is determined** solely by the **demand condition** that is an active agent.

# Price Determination under Perfect Competition

(a) Market Period:

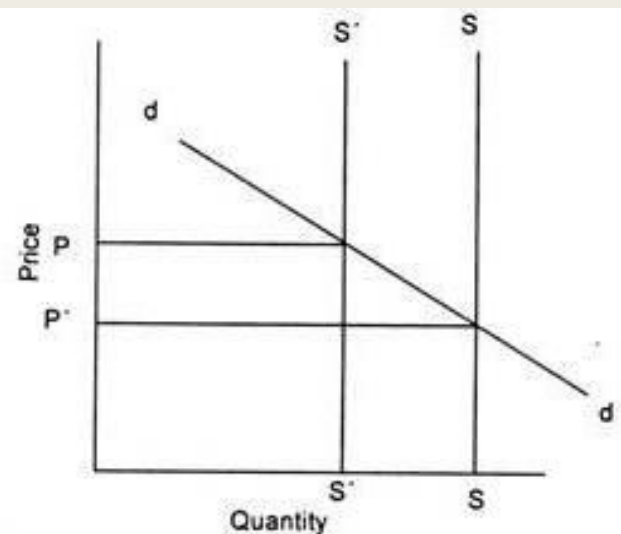


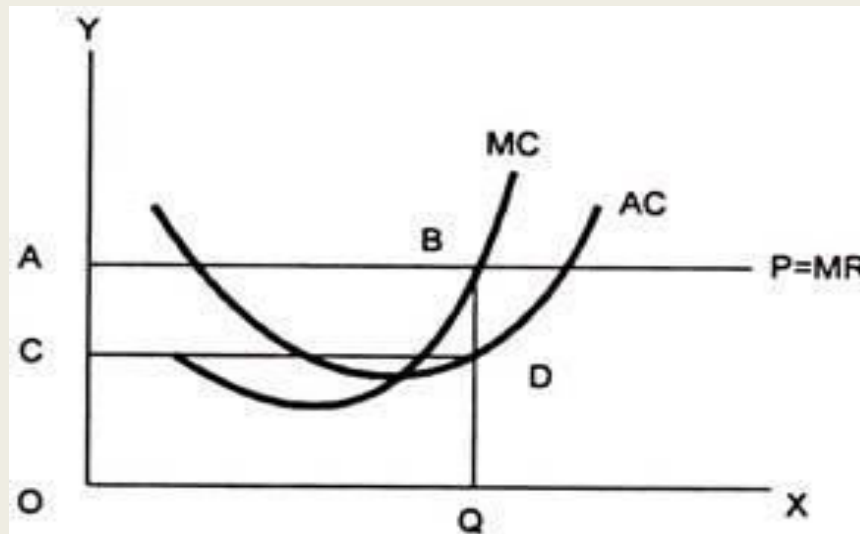
Fig. 4-2. Change in supply in market period.

- If the supply of the product decreases, the supply curve shifts leftwards from  $SS$  to  $S'S'$ , the price increases from  $OP$  to  $OP'$ .
- In this case **price is determined by supply**, the supply being an active agent.
- **Demand curve** remaining the **same**, the **decrease in supply shifts** the supply curve to its **left to  $S'S'$** . Consequently, the **price rises** from  **$OP$  to  $OP'$** .
- The **price below which the seller declines to offer** for any amount of his product is known as '**reserve price**'.
- The seller faces two extreme price-levels; at one he is **ready to sell the whole stock** and the other **he refuses to sell any**. The amount he offers for sale will vary with price.
- The seller will be ready to supply more at a higher price rather than at a lower one will depend upon his anticipations of future price and intensity of his need for cash.

# Price Determination under Perfect Competition

## (b) Pricing in the Short Run- Equilibrium of the Firm:

- Short period is the span of time so short that **supply cannot be increased to meet increased demand**. Therefore, supply curve is elastic.



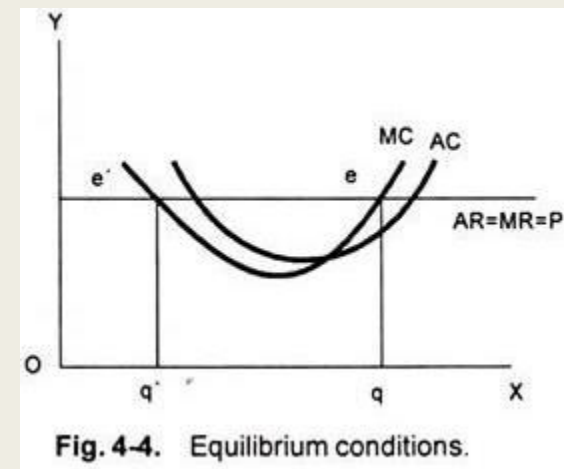
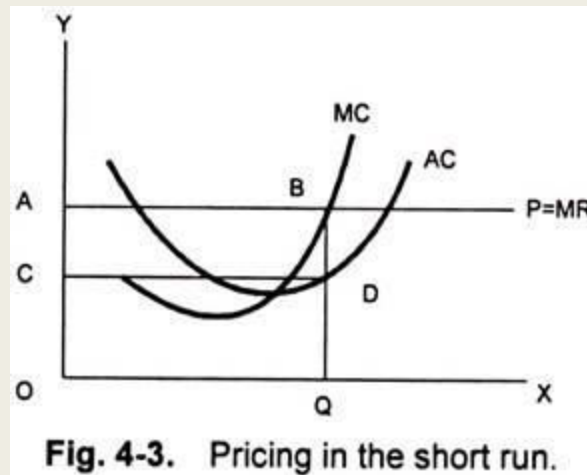
**Fig. 4-3.** Pricing in the short run.

- Figure ,Demand curve, in a **perfectly competitive market**, is also the **average revenue curve and the marginal revenue curve** of the firm.
- The **MC intersects the AC at its minimum point**.
- The **U-shape** of both the cost curves reflects the **law of variable proportions operative in the short run** during which the size of the plant remains fixed.
- The firm is in **equilibrium at the point B** where the **MC curve intersects the MR curve**.

# Price Determination under Perfect Competition

## (b) Pricing in the Short Run- Equilibrium of the Firm:

- The firm supplies OQ output. The QD is the AC and the firm earns total profit equal to ABCD. The firm **maximizes its profit**.
- Earlier to the **point of equilibrium**, the firm **does not attain the maximum profit** as each additional unit of output brings more revenue than its cost.
- Any level of output greater than OQ brings less MR than MC.



For the equilibrium of a firm the two conditions must be fulfilled:

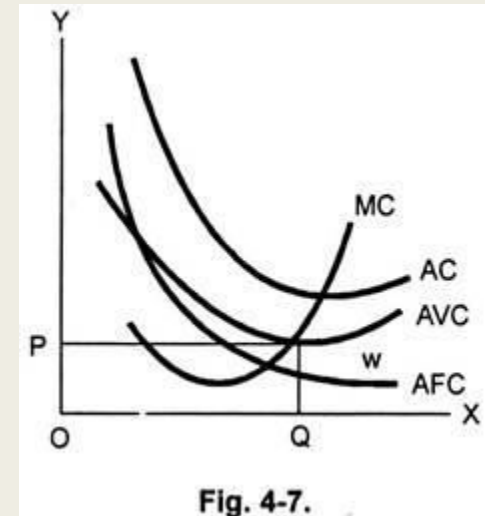
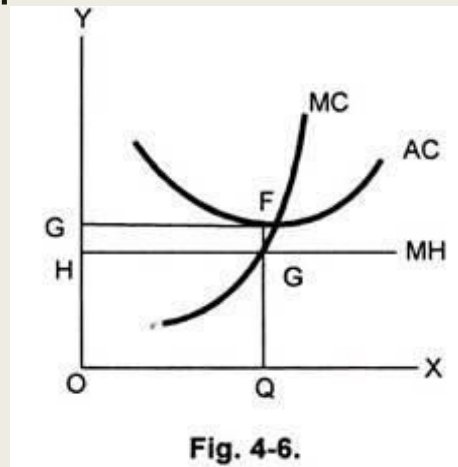
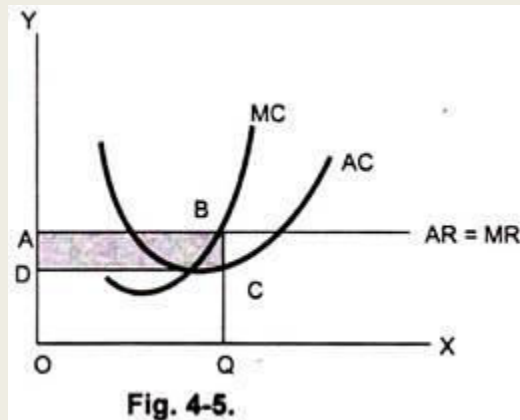
- (a) The marginal cost must be equal to the marginal revenue.
- (b) The MC curve cuts the MR curve from below i.e. the MC curve be rising at the point of intersection with the MR curve.

Thus, a perfectly competitive firm will adjust its output at the equilibrium point.

In the short-run equilibrium firms may earn supernormal profits, normal profits or may incur losses.

# Price Determination under Perfect Competition

## (b) Pricing in the Short Run- Equilibrium of the Firm:

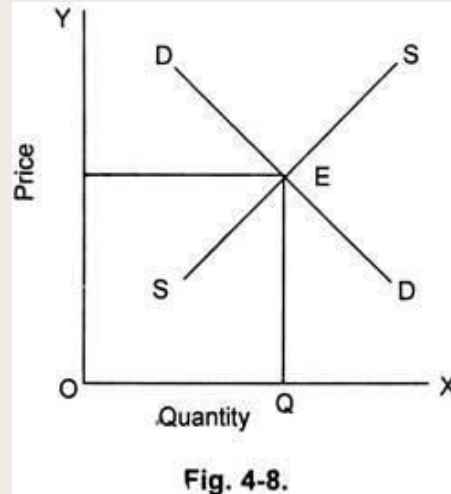


- Whether the firm makes **supernormal profits**, normal profits or incurs losses **depends on the level of the AC at the short run equilibrium**.
- If the **AC is below the AR**, the firm earns **supernormal profits**. Figure 4.5 illustrates that the **AC, QC is less than AR, QB**, and the firm earns **profits equal to ABCD**.
- Figure 4.6 shows that the **AC,EF is higher than GH ,AR** and the firm is incurring **loss equal to EFGH**. In this case the firm will continue to produce only if it is able to cover its VC. Firm will close down, since by discontinuing its operations the firm is better off; **it minimizes its losses**.
- The **point at which the firm covers its VC** is called 'the closing-down point'.
- If the **price falls below or AC rise**, the firm **does not cover its VC and is better off if it closes down**. Figure 4.7 explains shut- down point.

# Price Determination under Perfect Competition

## Equilibrium of the Industry:

- An industry is in **equilibrium** at that **price at which quantity demand is equal to the quantity supplied.**



- Figure 4.8, the point E at which industry demand and industry supply equalizes, the price OP is determined. OQ is the quantity demanded and quantity supplied. This, however, is a **short run equilibrium** where **at the market-determined price** some firms may be making supernormal profits, normal profits or making losses.
- Firms that are making **supernormal profits will expand** their capacity. Simultaneously **new firms will be attracted** into the industry.
- Free **movement of firms** in and outside the industry and readjustment of the existing firms in the industry **will establish a long run equilibrium** in which firms will just be **earning normal profits** and there will be **no tendency of entry or exit** from the industry.

# Price Determination under Perfect Competition

## (c) Pricing in the Long Run:

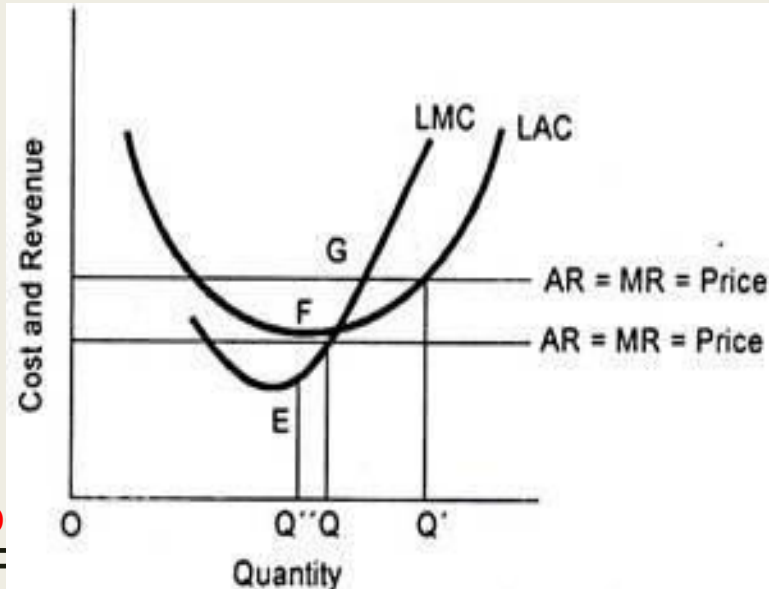
- The long run is a period in which all factors are variable.
- Thus, in the long run, firms can change their output by increasing their fixed equipment, enlarging the old plants or replace old plants with new plants. Firms can diminish their fixed equipment's by allowing them to wear out without replacement.
- Moreover, in the long run, new firms can also enter the industry and the existing firm can leave the industry.
- In the long run, LRAC and LRMC curves, which are relevant for making output decisions.
- Further, in the long run, average variable cost is of no particular relevance. The average total cost is of determining importance, since in the long run all costs are variable and none fixed.
- Thus, the conditions for long run equilibrium of perfectly competitive firm can be written as:

**Price or MR = Marginal Cost.**

**Price or MR = Minimum Average Cost.**

# Price Determination under Perfect Competition

## (c) Pricing in the Long Run:



firm at price  $OP'$ , but it is greater

Fig. 4-9. Pricing in the long run.

- The firm under **perfect comp** because though the **price  $OP'$**  is greater than the **AC** at this output and the firm is earning supernormal profits.
- Since all the firms are assumed to be identical, all would be earning supernormal profits.
- Hence, there will be attraction for the new firms to enter the industry. As a result, the **price will be forced down to the level  $OP$**  at which price, the firm is in equilibrium at F and is producing  $OQ''$  output.
- At point F or equilibrium output  $OQ''$ , the  $P=AC$ , and hence the firm will be earning only **normal profits**.
- Therefore, at price  $OP$ , there will be **no tendency for the outside firms to enter the industry**. Hence, the firm will be in equilibrium at  $OP$  price and  $OQ$  output.

# Price Determination under Perfect Competition

## (c) Pricing in the Long Run:

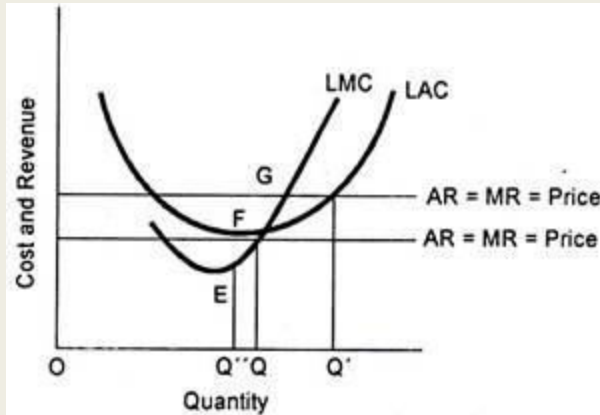


Fig. 4-9. Pricing in the long run.

- On the contrary, a firm under **perfect competition** **cannot be in the long run equilibrium at price  $OP''$** . Though **price  $OP'' = MC$  at point E**, or at output  $OQ''$  but **price  $OP''$  is lower than the AC** at this point and thus the firm will be **incurring losses**.
- Since all the **firms in the industry are identical** in respect of cost curves, **all would be incurring losses**. **To avoid these losses, some of the firm will leave** the industry.
- As a result, the **price will rise to  $OP$** , where again all firms are making **normal profits**. When the price  $OP$  is reached, the firms would have **no further tendency to quit**.
- Thus, at price  $OP$ , the firm under perfect competition is in equilibrium in the long run when: **Price = MC = Minimum AC**
- Now, at **price  $OP$** , besides **all firms being in equilibrium** at output  $OQ$ , the **industry will also be in equilibrium**, since there will be **no tendency for new firms to enter or the existing firms to leave the industry**, because all will be earning normal profits.
- Thus, at  **$OP$  price, full equilibrium**, i.e. equilibrium of all the individual firms and also of the industry, as a whole, is achieved in the long run under perfect competition.

# Price determination and firms' equilibrium under monopolistic competition:

- Monopolistic competition-
- Many firms offer products or services that are **similar, but not perfect substitutes**.
- Barriers to entry and exit in a monopolistic competitive industry are low, and the **decisions of any one firm do not directly affect those of its competitors**.
- The business strategy is **brand differentiation**.
- Organizations need to make **optimum adjustments in the prices and output sold** to attain equilibrium.
- Organizations also need to pay attention toward the **product design and product promotion in the market**.
- Organization should study its individual equilibrium, but group equilibrium of all organizations existing in the market.

Let us first understand individual equilibrium under monopolistic competition.

- As we know **every seller**, irrespective of the market structure, is **willing to maximize his/her profits**.
- In monopolistic competition, **profits are maximized** when **MR=MC**.
- The price determined at this point is known as **equilibrium price** and the output produced at this point is called **equilibrium output**.

# Price determination and firms' equilibrium under monopolistic competition:

## Equilibrium in Short Run:

- In the short run, an organization attains its **equilibrium** where **MR=MC** and sets its **price according to its demand curve**. Thus, profits are maximized when **MR=MC**.

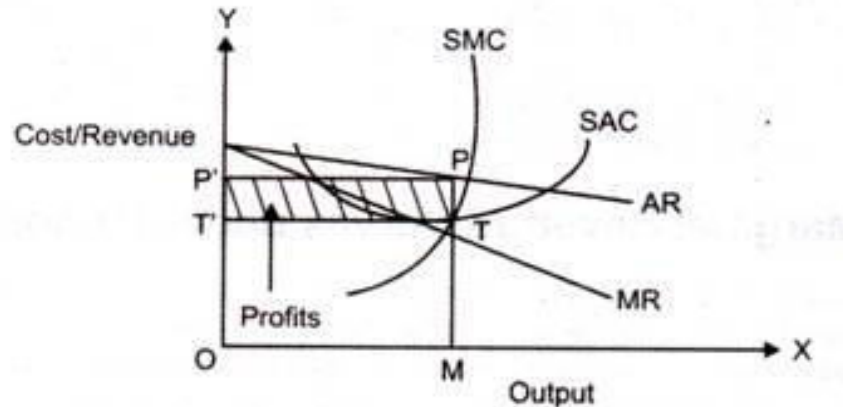


Figure-2: Equilibrium in the Short Run

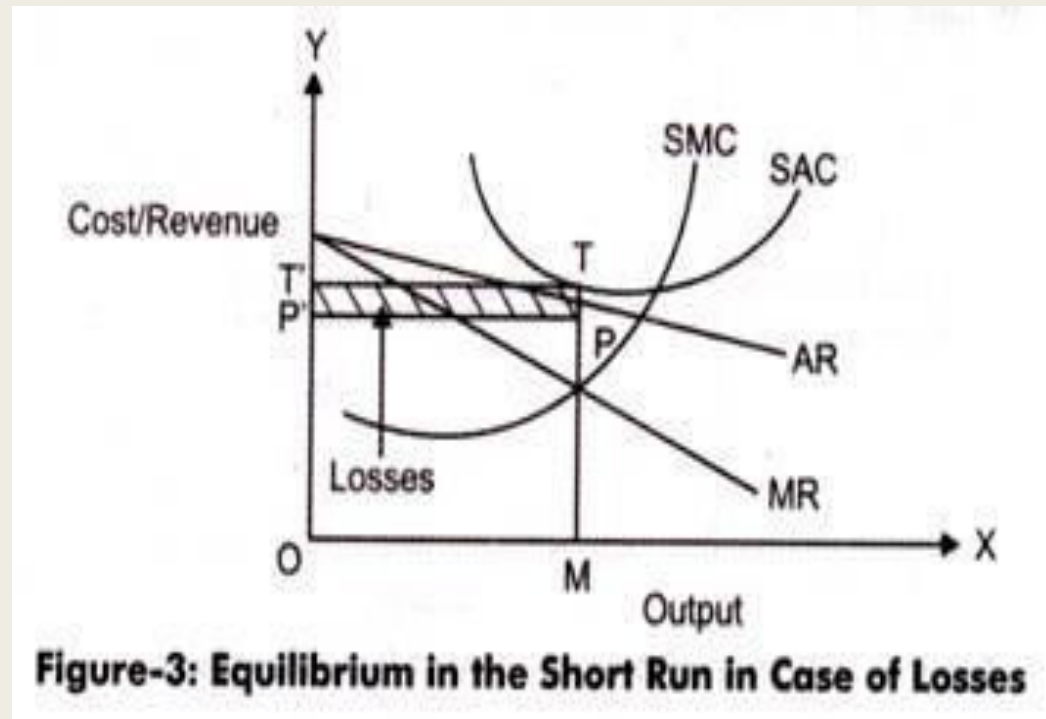
In Figure-2,

- MR intersects SMC at output **OM** where price is **OP'** (which is equal to **MP**). This is because **P is the, point on AR curve**, which is price.
- In short run, firm in monopolistic competition is earning **supernormal profit**.
- **Supernormal profit per unit of output** is the **difference between the AR and AC**.
- **AR** at equilibrium point is **MP** and **AC** is **MT**.
- **PT** is the supernormal profit per unit of output.
- Supernormal profit is measured by the **area of rectangle P'PTT'**.

# Price determination and firms' equilibrium under monopolistic competition:

## Equilibrium in Short Run:

- On the other hand, when  $MC > MR$ , organizations would **incur losses**, as shown in Figure-3:



In Figure-3,

- $OP'$  is smaller than  $MT$ , which implies that **AR is smaller than AC**.
- $TP$  is representing the **loss per unit of output**. Therefore **total loss** is depicted from rectangle **T'TPP'**.

# Price determination and firms' equilibrium under monopolistic competition:

## Equilibrium in Long Run:

- In the long run, there is a **gradual decrease in the profits** of organizations. This is because in the long run, **several new organizations enter the market** due to freedom of entry and exit under monopolistic competition.
- When these new organizations start production the **supply would increase and the prices would fall**.
- Consequently, **AR curve shifts from right to left** and **supernormal profits are replaced with normal profits**.

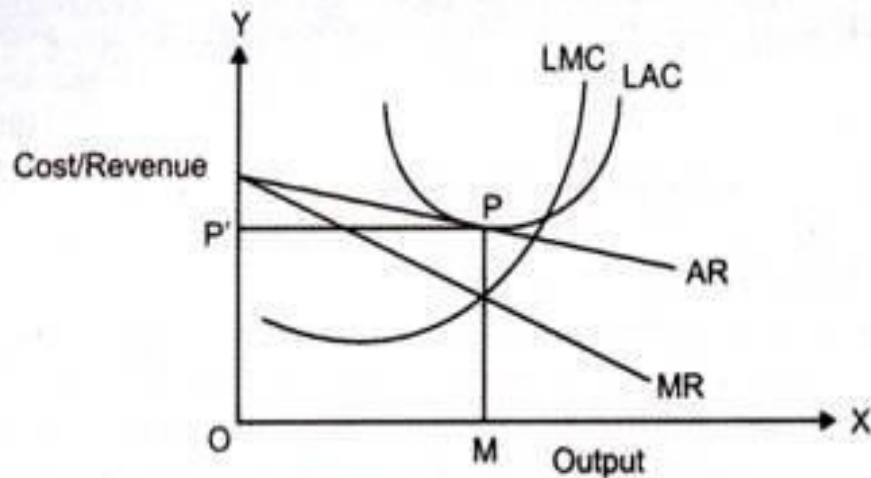
In the long run,

- the AR curve is **more elastic** than that of in the short run.
- This is because of an **increase in the number of substitute** products in the long-run.
- The long-run equilibrium of monopolistically competitive organizations is achieved when **AR=AC**. In such a case, organizations receive **normal profits**.

# Price determination and firms' equilibrium under monopolistic competition:

## Equilibrium in Long Run:

Figure-4 shows the long-run equilibrium position under monopolistic competition:



**Figure-4: Equilibrium in the Long Run**

- In Figure-4, **P** is the point at which **AR curve touches the average cost curve (LAC)** as a tangent.
- **P** is regarded as the **equilibrium point** at which the **price level is MP** (which is also equal to **OP'**) and **output is OM**.
- In the present case **AC=AR**, that is **MP**. Therefore, in long run, the **profit is normal**.
- In the short run, equilibrium is attained when **MR=MC**. However, in the long run, both the conditions **(MR=MC and AR=AC)** must hold to attain equilibrium.

# Price determination and firms' equilibrium under oligopoly:

- Oligopoly –
  - a **small number of firms**, none of which can keep the others from having significant influence.
  - There is no precise upper limit to the number of firms in an oligopoly, but the **number must be low enough** that the actions of **one firm significantly influence the others**.
  - Two types of oligopoly-
    - ‘**tight**’ oligopoly situation in which **two or three firms dominate** the entire market.
    - ‘**loose**’ oligopoly situation where **six or seven firms** occupy the maximum share of the market, other firms share the balance.
  - Oligopoly includes both **differentiation and standardization**.
  - It encompasses the cases in which firms are acting **in collusion and in which they are acting independently**. Therefore, the existence of various forms of oligopoly prevents the development of a general theory of price and output.
  - The element of **mutual interdependence** in oligopolistic market further complicates the determination of price and output.

# Price determination and firms' equilibrium under oligopoly:

## ■ Oligopoly –

In spite of these difficulties, two interrelated characteristics of oligopolistic pricing stand out:

1. **Oligopolistic prices** tend to be **inflexible or Sticky**. Price change **less frequently** in Oligopoly than they happen under other competitions like perfect, competition, monopoly and monopolistic competition.
2. When **oligopolistic prices change**, firms are likely to **change their prices together** they act in collusion in setting and changing prices.

Keeping these facts in mind, the price and output determination under oligopoly is in the following situations:

- Price Determination in Non-Collusive Oligopoly.
- Equilibrium under Collusion:

# Price determination and firms' equilibrium under oligopoly:

## 1. Price Determination in Non-Collusive Oligopoly:

- In **Non-Collusive Oligopoly**, each firm follows an independent price and output policy on the basis of its **judgment about the reactions of his rivals**.
- If the firms are producing **homogeneous products**, **price war may occur**.
- Each firm has to **fix the price at the competitive level**.
- On the contrary, in case of **differentiated oligopoly**, due to **product differentiation**, **each firm has some monopoly control over the market** and therefore charge **near monopoly price**.

Thus the actual price may fall between the two limits:

- (i) The Upper Limit of Monopoly Price and,
- (ii) The Linear limit of Competitive Price.

Practically, there is every possibility to determine the exact price within these limits. However there may be the following possibilities:

- (i) There may be **complete price instability** in the market which results in **price war**.
- (ii) The **price may settle down at intermediate level** due to the working of the **market forces**.
- (iii) The firm may accept the **prevailing price** and adjust itself according **to prevailing price**.

So long as the **firm earns adequate profits at the prevailing price**, it **may not try to change it**. **Any effort to change it may create uncertainties** in the market.

**A firm will stick to that price to avoid uncertainties**. Thus the price tends to be rigid where oligopolist takes independent action.

# Price determination and firms' equilibrium under oligopoly:

## 2. Equilibrium under Collusion:

- The modern economists are of the view that **independent price determination cannot exist for long** in oligopoly. It leads to **uncertainty and insecurity** and to overcome them there is a **tendency among oligopolists to act collectively by tacit collusion**.
- In addition, the firms can gain the **economics of production**. All the firms in oligopoly tend to **enlarge their size and lower their costs of production per unit and capture maximum share of the market**.
- **Collusive oligopoly** is a situation in which firms in a particular industry decide to **join together as a single unit for the purpose of maximising their joint profits and to negotiate among themselves so as to share the market**.

The former is known as the **joint profit maximisation cartel** and the latter as the **market-sharing cartel**.

- There is another type of collusion, known as **leadership**, which is based on **tacit agreements**.
- Under it, **one firm acts as the price leader and fixes the price** for the product while **other firms follow it**.
- Price leadership is of three types: low-cost firm, dominant firm, and barometric.

# Price determination and firms' equilibrium under monopoly:

- A monopoly refers to when a company and its product offerings dominate a sector or industry.
- Monopolies can be considered an extreme result of free-market capitalism in the absence of any restriction or restraints.
- In monopoly, a single company or group becomes large enough to own all or nearly all of the market (goods, supplies, commodities, infrastructure, and assets) for a particular type of product or service.
- The term monopoly is often used to describe an entity that has total or near-total control of a market.

Under monopoly, for the equilibrium and price determination there are two different conditions which are:

1. Marginal revenue must be equal to marginal cost. ( $MR=MC$ )
2. MC must cut MR from below.

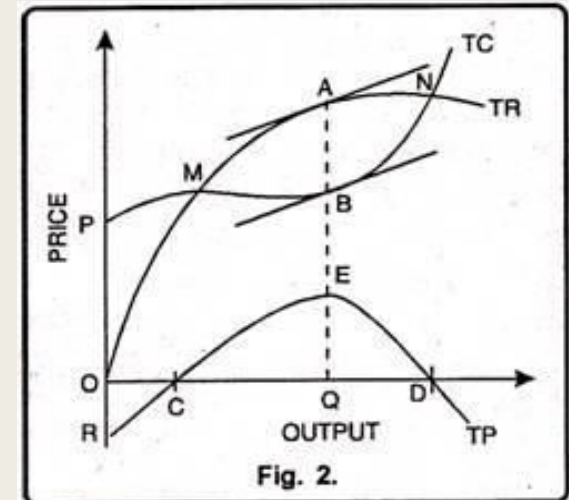
However, there are two approaches to determine equilibrium price under monopoly viz.;

1. Total Revenue and Total Cost Approach.
2. Marginal Revenue and Marginal Cost Approach.

# Price determination and firms' equilibrium under monopoly:

## Total Revenue and Total Cost Approach:

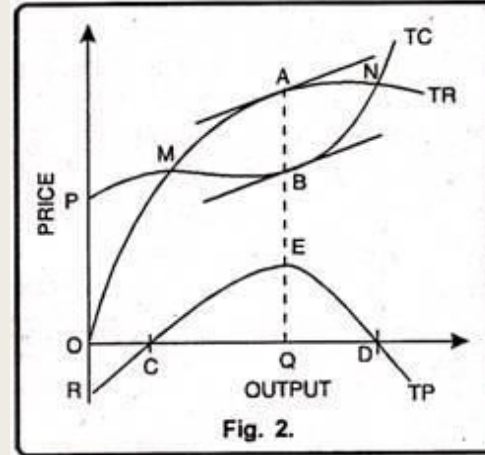
- Monopolist can earn **maximum profits** when **difference between TR and TC is maximum**.
- By **fixing different prices**, a monopolist tries to find out **the level of output where the difference between TR and TC is maximum**.
- The **level of output where monopolist earns maximum profits** is called the **equilibrium situation**. This can be explained with the help of fig. 2.



- In Fig. 2, TR curve **starts from the origin**. It indicates that **at zero level of output, TR will also be zero**.
- TC curve starts from **P**. It reflects that **even if the firm discontinues its production, it will have to suffer the loss of fixed costs**.

# Price determination and firms' equilibrium under monopoly:

Total Revenue and Total Cost Approach:



- TP (Total Profit) curve starts from point R showing that initially firm is faced with **negative profits**.
- Now as the firm increases its production, TR also increases. But in the initial stage, the rate of increase in TR is less than TC. Therefore, RC part of TP curve reflects that firm is incurring losses.
- At point M,  $TR=TC$ . It shows that firm is working under no profit, no loss basis, which is called the **breakeven point**.
- When firm produces more than point M, TR will be more than TC. TP curve also slopes upward. It shows that firm is earning profit.
- Now as the TP curve reaches point E then the firm will be earning maximum profits. This amount of output will be termed as equilibrium output.

# Price determination and firms' equilibrium under monopoly:

## Marginal Revenue and Marginal Cost Approach:

According to this approach, a **monopolist will be in equilibrium** when two conditions are fulfilled i.e.,

- (i)  $MC=MR$  and
- (ii)  $MC$  must cut  $MR$  from below.

The study of equilibrium price according to this analysis can be conducted in two time periods.

1. The Short Run
2. The Long Run

### 1. Short Run Equilibrium under Monopoly:

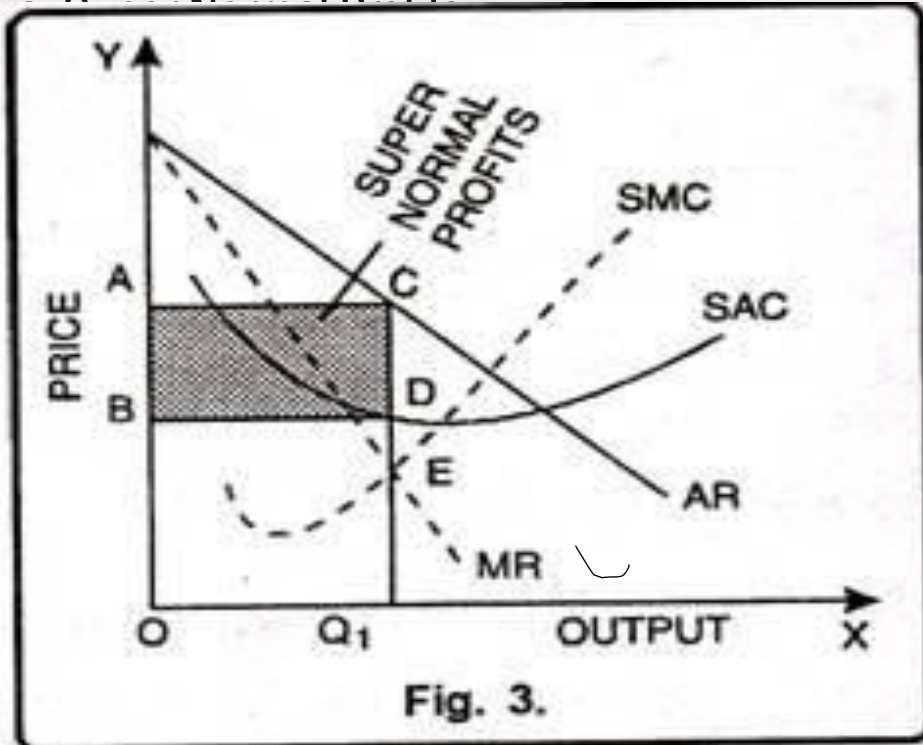
- **Short run period** refers to that **period in which the monopolist has to work with a given existing plant**, i.e., cannot change the fixed factors like, plant, machinery etc. in the short period.
- Monopolist can **increase his output** by **changing the variable factors**. In this period, the monopolist can enjoy **super-normal profits, normal profits and sustain losses**.

# Price determination and firms' equilibrium under monopoly:

Marginal Revenue and Marginal Cost Approach:

## 1. Short Run Equilibrium under Monopoly:

These three possibilities are described as follows:



in more than AC, he will get super normal profit where  $MC=MR$ . This limit will indicate

SAC- short run average cost curve

SMC- short run marginal cost curves

AR- Average Revenue curve

MR-marginal revenue curves

because both the conditions of equilibrium are fulfilled ( $MR = MC$  and  $MC$  intersects the  $MR$  curve from below).

- At equilibrium the monopolist will produce  $OQ_1$  level of output and sells it at  $CQ_1$  price which is more than  $AC$   $DQ_1$  by  $CD$  per unit.
- Therefore, total profits of the monopolist is given by the shaded area  $ABDC$ .

# Price determination and firms' equilibrium under monopoly:

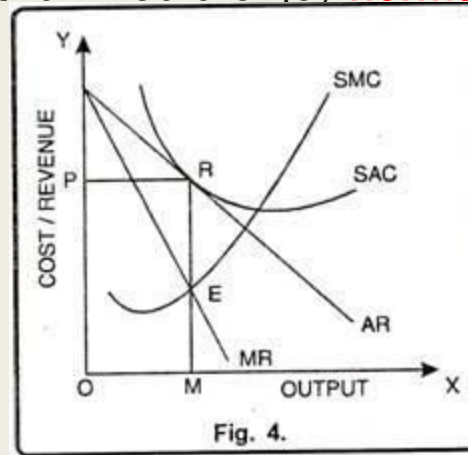
## Marginal Revenue and Marginal Cost Approach:

### 1. Short Run Equilibrium under Monopoly:

These three possibilities are described as follows:

#### b. Normal Profits:

- A monopolist in the short run would enjoy **normal profits** when  $AR=AC$ .



- In Fig. 4, the firm is in **equilibrium at point E** where **MC=MR**.
- The firm is producing **OM level of output**.
- At OM level of output, **AC curve** touches the **AR curve** at point **PR**. Therefore, at point 'P' **price OR is equal to average cost** of the total product. In this way, monopoly firm enjoys the **normal profits**.

# Price determination and firms' equilibrium un

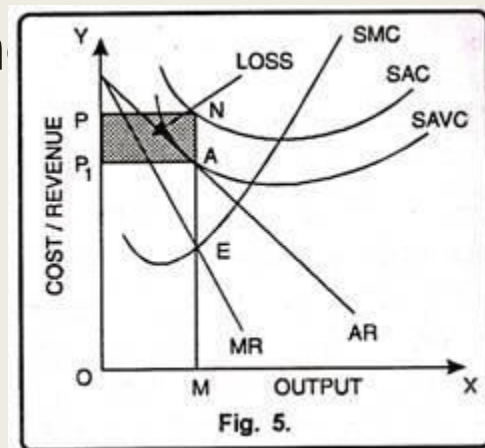
Marginal Revenue and Marginal Cost Approach:

## 1. Short Run Equilibrium under Monopoly:

These three possibilities are described as follows:

### c. Minimum Losses:

- In the short run, the monopolist may have to incur losses. This happens if in short run price falls below the variable cost (VC).
- In other words, if price falls due to depression and demand fall, the monopolist will continue to produce as long as price covers the AVC.
- Once the price falls below the AVC, monopolist will stop production. Thus, a monopolist in the short run equilibrium has to bear the minimum loss equal to fixed costs.
- Therefore, equilibrium price will be equal to average variable cost. The equilibrium is at point E. At point E,  $MC=MR$  and he produces OM level of output.
- At OM, equilibrium price is  $OP_1$ . At  $OP_1$  price, AVC touches the AR curve at point A.
- It signifies that the firm will cover only average variable cost from the prevailing price.
- At  $OP_1$  price, firm will bear loss of fixed cost i.e., A per unit. The firm will bear the total loss equal to the shaded area  $PP_1AN$ .
- Now if the price falls below  $OP_1$ , the monopolist will stop production. It is so because if he continues production, he will have to bear the loss of variable costs along with fixed costs.

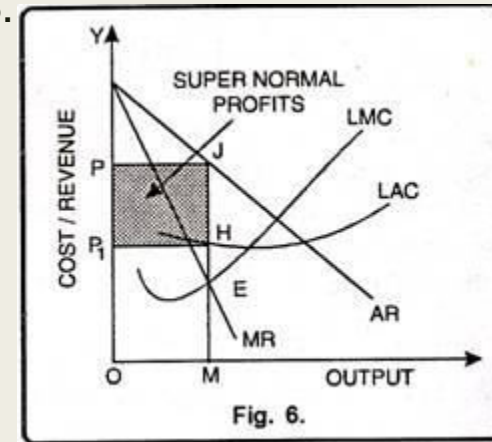


# Price determination and firms' equilibrium under monopoly:

## Marginal Revenue and Marginal Cost Approach:

### 2. Long Run Equilibrium under Monopoly:

- Long-run -period in which **output can be changed by changing the factors of production.**
- In other words, all **factors are variable** and monopolist would choose that plant size which is most appropriate for specific level of demand.
- Here, **equilibrium** would be attained **at that level of output** where the long-run **MC curve cuts the MR curve from below.** This can be shown with the help of Fig. 6.



- In Fig. 6 monopolist is in **equilibrium** at **OM** level of output. At **OM** level of output **LMR = LMC** and the monopolist fixes **OP** price.
- **HM** is the **LAC**. **Price OP** being **more than LAC** i.e., **HM** which fetch the monopolist **super normal profits**.
- Accordingly, the monopolist earns **JM - HM = JH** **super normal profit per unit**. His total **super normal profits** will be equal to shaded **area PJHP1**.

# Price discrimination:

- **Price discrimination** means that the **producer charges different prices for different consumers** for the same goods and service. Price discrimination occurs when **prices differ even though costs are same**.
- In case they **charge different prices in different markets**, **people go to the market where price is low**. Then it gets equalized in the long run.

As the following examples suggest, price discrimination is a common business practice.

- Airlines charge full fares to business travellers, while offering discount fares to vacationers.
- Providers of professional services (doctors, consultants, lawyers, etc.) set different rates for different clients.
- Manufacturers introduce products at high prices before gradually dropping price over time.
- Publishers of academic journals charge much higher subscription rates to libraries and institutions than to individual subscribers.
- Businesses offer student and senior citizen discounts for many goods and services.
- Manufacturers sell the same products at higher prices in the retail market than in the wholesale market.
- Movies play in “first-run” theatres at higher ticket prices before being released to suburban theatres at lower prices.

# Price discrimination:

- When a **firm practices price discrimination**, it **sets different prices for different market segments**, even though its **costs of serving each customer group are the same**. Thus, price discrimination is **purely demand based**.
- If firms charge different prices for the “same” good or service because of cost differences it is cost-based pricing and it does not fall under price discrimination.
- Two conditions must hold for a firm to practice price discrimination profitably.
  - i. First, the firm must be able to **identify market segments** that differ with respect to **price elasticity of demand**. As we show shortly, the **firm profits by charging a higher price to the more inelastic** (i.e., less price-sensitive) market segment(s).
  - ii. Second, it must be possible to enforce the **different prices paid by different segments**. This means that **market segments receiving higher prices must be unable to take advantage of lower prices**. (In particular, a **low-price buyer must be unable to resell** the good or service profitably to a high-price buyer).

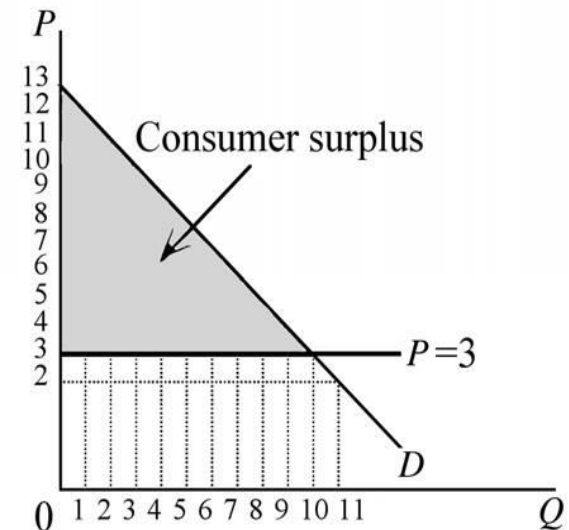
## Objectives of Price Discrimination:

1. To dispose the surpluses
2. To develop new market
3. To Maximize use of unutilized capacity
4. To Earn monopoly profit
5. To Retain export market
6. To Increase the sales

# Degrees of Price Discrimination:

## First Degree Price Discrimination:

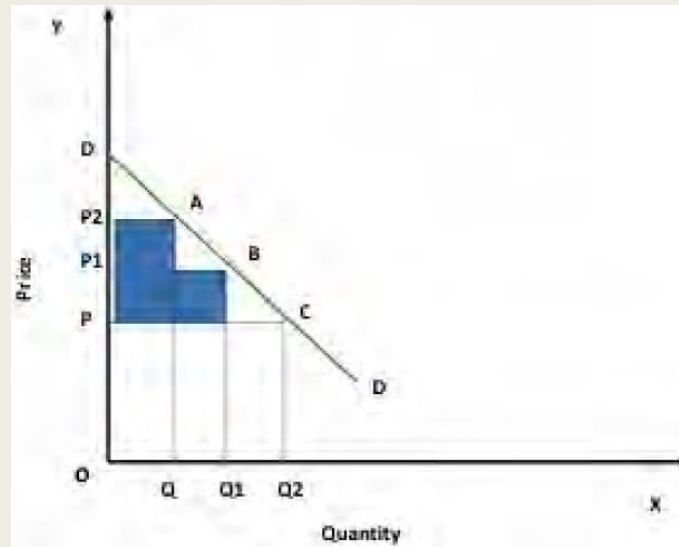
- Firm **charges a different price to each** of its customers.
- The **maximum willingness to pay is fixed as price** which is called as **reservation price**.
- In perfect market the **difference between demand and marginal revenue** is the **profit** (for additional unit producing and selling).
- Firms **do not know the customers willingness**, therefore different prices.
- In **imperfect market** it is **not possible to price** for each and every customer.
- The purpose of first-degree price discrimination is to **extract the total amount of consumer surplus** from each individual customer.



# Degrees of Price Discrimination:

## Second Degree Discrimination:

- Second-degree price discrimination occurs when firms attempt to maximize profits by selling their product in “blocks” or “bundles” rather than one unit at a time.
- Firm charges different prices per unit for different quantities of the same goods or service. They follow block pricing method.
- The units in a particular block will be uniformly priced.
- The possible maximum price is charged for some given minimum block of output purchased by the buyers and then the additional blocks are sold at lower prices.



- There are two common types of second-degree price discrimination: **block pricing and commodity bundling.**

# Degrees of Price Discrimination:

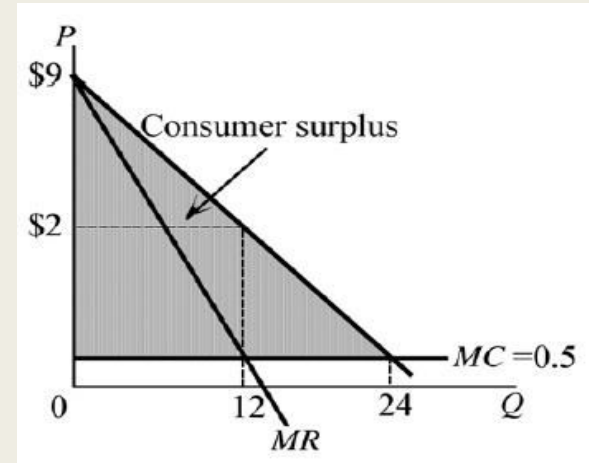
## Block Pricing

- Block pricing, or **selling a product in fixed quantities**, is **similar to first degree price discrimination** in that the **seller is trying to maximize profits by extracting all or part of the buyer's consumer surplus**.
- Eight frankfurter rolls in a package and a six-pack of beer are examples of block pricing. The **rationale behind block pricing** is to **charge a price for the package that approximates, but does not exceed, the total benefits obtained by the consumer**. With block pricing the firm will attempt to get the consumer to pay for the full value received for the eight frankfurter rolls by charging a single price for the package. If frankfurter rolls were sold for \$0.10 each, the total expenditure by the typical consumer would be \$0.80. The firm will add the value of consumer surplus to the package of eight frankfurter rolls, as follows:

$$\begin{aligned}\text{Block price} = TR &= PQ + CS = PQ + 0.5(b_0 - P)Q \\ &= 0.1(8) + 0.5(0.3 - 0.1)8 = \$1.60\end{aligned}$$

The profit earned by the firm is

$$\pi = TR - TC = PQ + 0.5(b_0 - P)Q - (MC \times Q) = \$1.60 - \$0.80 = \$0.80$$



- If this firm operated in a perfectly competitive industry and frankfurter rolls were **sold individually**, the **selling price would be \$0.10 per roll** and the firm would **break even**. In other words, the firm would **earn only normal profits**, since **TR = TC**. But in this scenario, the firm has earned an **excess revenue equal to 0.80\$**.

# Degrees of Price Discrimination:

## Second Degree Discrimination:

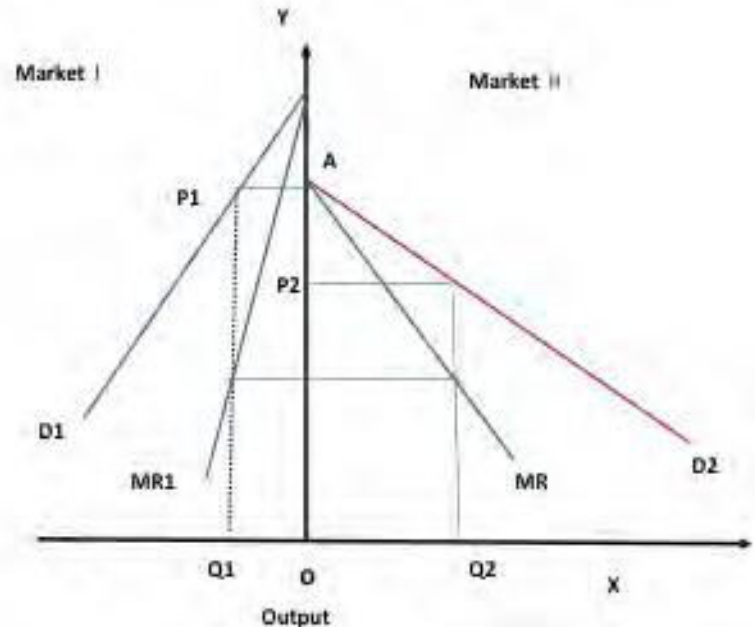
### Commodity Bundling

- Another form of second-degree price discrimination is **commodity bundling**.
- Commodity bundling involves **combining two or more different products into a single package**, which is **sold at a single price**.
- Like block pricing, commodity bundling is an attempt to **enhance the firm's profits by extracting at least some consumer surplus**.
- A vacation package offered by a travel agent that includes airfare, hotel accommodations, meals, entertainment, ground transportation, and so on is an example of commodity bundling.
- The hotel offers two kinds of vacation packages and discriminates the prices based on the customer category. Some customers look for Budget packages and some look for luxury packages. The packages are designed with facilities as per the value the customer is ready to pay. The customer who opts for Luxury package will obviously get more benefits, but **will pay more for each services** compared to the customer who opts for budget package. This is a strategy adopted by the firm to **attract variety of customers and also tries to earn maximum profit** by setting **higher prices for Luxury package**.

# Degrees of Price Discrimination:

## Third Degree Discrimination:

- Firm **segments the customers into groups with separate demand curves** and **charges different prices** from each group.
- The firm **divides** its **total output into many submarkets** and sets **different prices** for its product in each market **in relation to the demand elasticity**.
- There are **two markets I and II** with **demand curves D1 and D2**.
- D1 is **less elastic** and D2 is **more elastic** demand curve.
- The firm distributes **OQ1 to market - I at OP1 price** and **OQ2 to the market II at OP2 price**. **Market- I** has **less elastic** demand therefore **higher price** is charged.



# Degrees of Price Discrimination:

## Third Degree Discrimination:

- For third-degree price discrimination to be successful, it must not be possible for groups purchasing the good or service at a lower price to be able to resell that good or service to groups charged the higher price.
- If resales are possible, the firm would not be able to sell anything to the group paying the higher price because they would simply buy the good or service from the group eligible for the lower price.
- The rationale behind third-degree price discrimination is straightforward. Different individuals or groups of individuals with different demand functions will have different marginal revenue functions.
- Since the marginal cost of producing the good is the same, regardless of which group purchases the good, the profit-maximizing condition must be  $MC = MR_1 = MR_2 = \dots = MR_n$ , where  $n$  is the number of identifiable and separable groups.

# Pricing methods

The following points highlight the seven main methods of pricing policies. The methods are:-

1. Marginal Cost Pricing
2. Limit Pricing
3. Market Skimming Pricing
4. Penetration Pricing
5. Bundling Pricing
6. Peak Load Pricing

## 1. Marginal Cost Pricing:

- In Social welfare organizations, **maximum or economic efficiency** in resource allocation is achieved when **price is set equal to marginal cost**. This is called **marginal cost pricing**.
- It has been suggested that **non-profit enterprises** should pursue **marginal cost pricing**.
- However, marginal cost pricing **does not ensure positive profits** when the enterprise is enjoying **very large economies of scale**.
- To **induce the enterprise to continue producing** the product as it is socially beneficial, **subsidies should be paid** to the enterprise or else the **government should itself undertake the production** of the product **and meet its losses from the budgetary resources**. Thus, in such enterprises where **large economies of scale** occur, **marginal cost pricing is non-viable**.

# Pricing methods

## 2. Limit Pricing:

- **Limit pricing** refers to the pricing by **incumbent firm(s)** to **deter or inhibit the entry or the expansion of fringe firms**.
- Limit pricing implies that **firms sacrifice current profits** in order to **deter entry of new firms and earn future profits**.
- Limit pricing thus involves **charging prices below the monopoly price** in order to make **entry appear unattractive** (to limit entry).
- A low price would **discourage entry** if prices had a **commitment value**. But they do not, because prices can be changed quickly. Hence, if a potential entrant has complete information about the incumbent, limit pricing would be useless.
- It is the policy adopted by firms already in a market to reduce their prices so as to make it unprofitable for other firms to try to enter the market. The price so established is called an **entry forestalling price**.

## 3. Market Skimming Pricing:

- Skimming is adopted where a **new product is launched** and the seller has **little information on the acceptable price** in the market.
- The seller, therefore, **starts by setting a high price on the launch** of the product and then, **over a period of time, lowers the price to meet the varying price elasticities of demand**. This enables **gradual expansion** in capacity by the seller.
- This practice is followed in the **consumer durables market**.
- The seller chooses to **start by setting at a high price** to **avoid the risk of losing** on customers who are **willing to pay a high price**.

# Pricing methods

## 4. Penetration Pricing:

- Penetration pricing is a strategy **employed by businesses introducing new goods or services** into the marketplace.
- With this policy, the **initial price** of the good or service is **set relatively low in hopes of 'penetrating'** into the new marketplace quickly and securing significant market share.
- Penetration pricing may be wise if the **firm expects strong competition** very soon after introduction.
- A low penetration price may be called a **'stay out' price**.
- It **discourages** competitors from **entering the market**. Once the product has **secured a desired market share**, its producers can then **review** business conditions **and decide** whether to **gradually increase** the price.
- This will only be possible where demand is believed to be **highly elastic**, i.e., demand is **price-sensitive** and either **new buyers will be attracted or existing buyers will buy more** of the product **as a result of a low price**.
- A **successful penetration pricing** strategy may lead to **large sales volumes/market shares** and thus increased production. Thus firm enjoys the benefit of **economies of scale** and experience lead to **lower production costs**.
- This also promote **complementary and captive products**. The **main product** may be **priced with a low mark-up** to attract sales (it may even be a loss-leader). Customers are then **sold accessories** (which often only fit the manufacturer's main product) which are sold at **higher mark-ups**.

# Pricing methods

## 5. Bundling Pricing:

- It is a pricing practice when **two or more products are sold as bundle**. Also, the **constituent products of the bundle are not sold individually**.
- Price bundling is a strategy whereby a **seller bundles together many different goods/items** and offers the entire bundle at a **single price**.
- There are two forms of price bundling—
  - i. **pure bundling**, where the seller **does not offer** buyers the **option of buying the items separately**, and
  - ii. **mixed bundling**, where the seller offers the **items separately at higher individual prices**.
- **Mixed bundling is usually preferable** to pure bundling, both because there are fewer legal regulations forbidding it, and because the reference price effect makes it appear even more attractive to buyers.
- Suppose there are two buyers, A and B, and two products, X and Y. Suppose buyer A values product X at 20 units above the cost of production, and values Y at 15 units above the cost of production. Suppose buyer B values Y at 20 units above the cost of production, and X at 15 units above the cost of production.

# Pricing methods

## 5. Bundling Pricing:

- The ideal thing for the seller would be to practice price discrimination: charge each buyer the maximum that buyer is willing to pay. However, this may be forbidden by law or otherwise difficult to implement.
- Instead, the seller can pursue the following bundling strategy- **charge slightly under 35 units** above production cost for the combination of X and Y. Since both buyers value the combination at 35 units, this deal appeals to both buyers. This allows the seller to obtain the entire **social surplus as producer surplus**.
- The seller can even make this a **mixed bundling strategy** – offer both X and Y individually for 20 units, and offer the combination for slightly less than 35 units.

# Pricing methods

## 6. Peak Load Pricing:

- It is a pricing practice where **price varies with time of the day**. A firm **fixes higher price** for a commodity or service with high demand during **peak period** and **lower price** be charged for **off-peak period** when demand is lower. This is **dual pricing** and is also known as **peak-load pricing**.
- The peak-load pricing is also suggested **when cost of production is different in the two time periods**. In the **peak period** when **capacity is strained, marginal cost is higher as compared to the off-peak period**. Thus, different prices of a commodity for two periods also reflect the different costs of production of the commodity in the two periods.
- In India charges for trunk or STD calls during day time which is the peak period is higher and charges for the off-peak period from 9 P.M. to 6 A.M. are lower. Similarly, airlines often follow peak-load pricing; in off season they often lower their rates as compared to the peak periods of travel.

# Economics for Managers

Prof. Jagadeesh Babu MK

## **MODULE FIVE: FACTOR MARKET AND FACTOR PRICING**

# Theories of factor pricing: wages and rent:

- The theory of factor pricing is concerned with the **principles according** to which the **price of each factor of production is determined and distributed**.
- The **distribution of factors of production** can be of two types, namely **personal and functional**.
- **Personal distribution** is concerned with the **distribution of income among different individuals**.
- It is associated with the **amount of income generated not with the source of income**. The source of income is not given priority. For example, an individual earns Rs. 20,000 per month; this income can be earned by him/her by wages, rents, or dividends.

- **Functional distribution** is associated with the **distribution of income** among different factors of production as per their functions.
- It is concerned with the source of income, such as wages, rents, interests, and profits.
- In regard of distribution of factors of production, there are two theories, namely
  - marginal productivity theory and
  - modern theory of factor pricing.

# Marginal productivity theory

- This theory contributes a significant role in factor pricing. It is a classical theory of factor pricing that was advocated by a **German economist, T.H. Von Thunen** in **1826**.
- The theory was **further developed and discussed** by various economists, such as **J.B. Clark, Walras, Barone, Ricardo, and Marshall**.
- According to this theory, **under perfect competition**, the **price of factor of production is equal to its marginal productivity**.
- When an organization increases one unit of a factor of production (while keeping the other factors constant), the marginal productivity increases to a certain level of production. After reaching a certain level, the marginal productivity starts declining.
- On the other hand, if the **marginal revenue is greater than marginal cost**, the organization opts for **employing an additional unit** of factor of production.

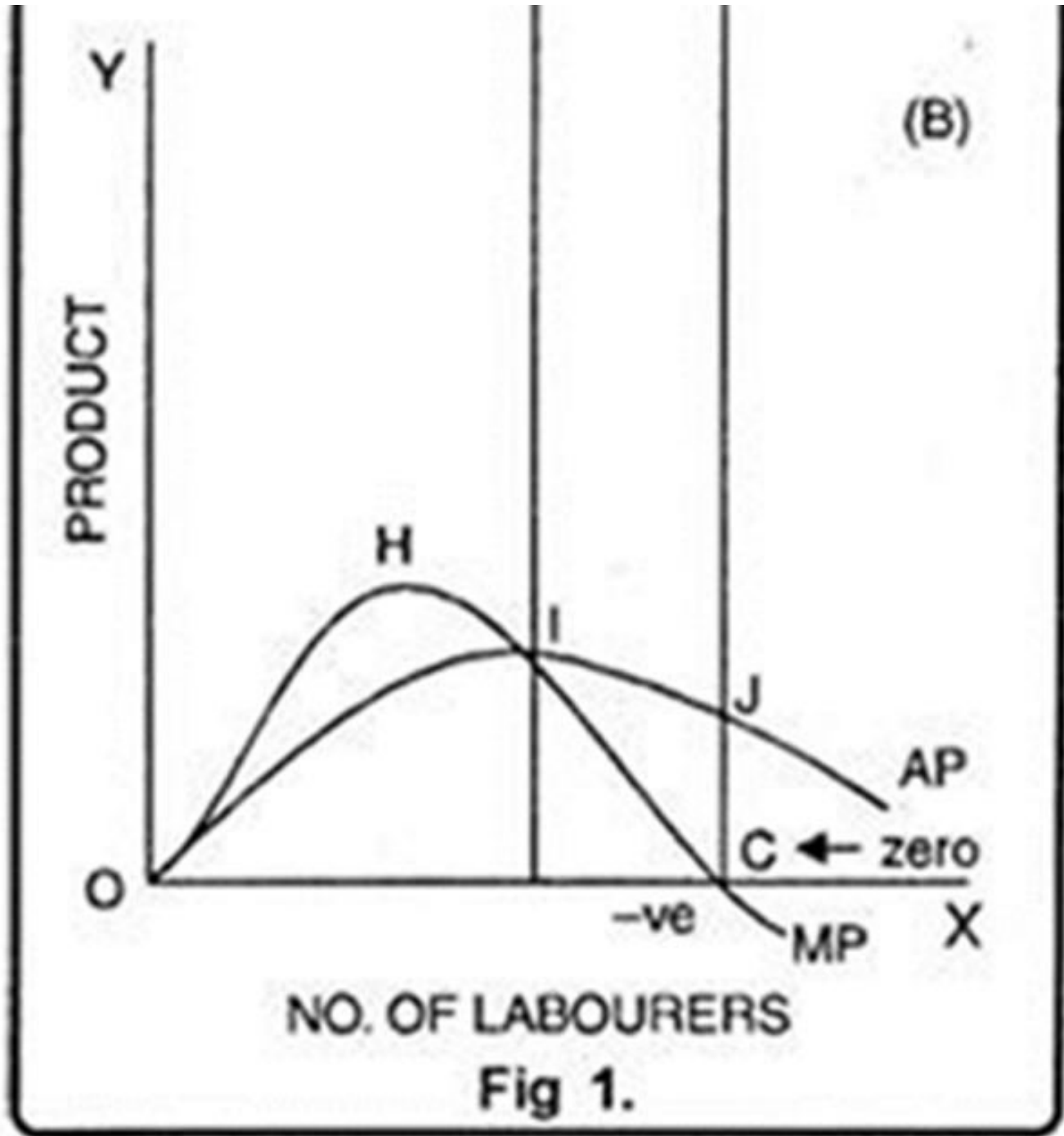


Fig 1.

# Marginal productivity theory

## Types of Marginal Productivity:

### i. Marginal Physical Productivity:

- According to M.J. Ulmer, “**Marginal physical productivity** may be defined as the **addition to total production** resulting from **employment of one unit of a factor of production**, all other things being constant.”

The general formula for marginal physical productivity is as follows:

- $MPP_n = TPP_n - TPP_{n-1}$
- Where  $MPP_n$  = Marginal physical productivity for nth unit of labor
- $TPP_n$  = Total physical productivity of n units of labor
- $TPP_{n-1}$  = Total physical productivity of n-1 units of labor
- **Example.** Suppose one labor is able to produce four quintals of wheat. If one more labor is hired, then the yield of wheat would reach to eight quintals. In such a case, the marginal physical productivity for the additional labor is four quintals of wheat ( $8-4=4$ ).

# Marginal productivity theory

## Types of Marginal Productivity:

### ii. Marginal Revenue Productivity:

As per M.J. Ulmer, “**Marginal revenue productivity** may be defined as the **addition to total revenue** resulting from **employment of one unit of a factor of production**, all other things being constant.”

Let us understand the concept of marginal revenue productivity with the help of an example. Suppose one labor is able to produce wheat, which is worth of Rs. 50. If one more labor is hired, then the revenue generated from wheat would be Rs. 60. In such a case, the marginal revenue productivity for the second labor is Rs. 10 (60-50-10).

The formula for calculating marginal revenue productivity is as follows:

$$\text{MRP} = \text{MPP} * \text{MR}$$

Where MRP = Marginal Revenue Productivity

MR= Marginal Revenue

# Marginal productivity theory

## Types of Marginal Productivity:

### iii. Value of Marginal Productivity:

According to Ferguson, “The **value of marginal product of a variable factor** is equal to its **marginal product multiplied by the market price** of the commodity in question.”

The formula of value of marginal productivity is as follows:

$$VMP = MPP * AR$$

Where, VMP = Value of marginal productivity

MPP = Marginal physical productivity

AR = Market price of product

Let us understand the concept of value of marginal productivity with the help of an example. Suppose the market price of wheat is Rs. 10 per quintal and the marginal physical productivity for the additional labor is four quintals of wheat. In such a case, the value of marginal productivity for the additional labor would be Rs. 40 (4\*10=40).

# Marginal productivity theory

Assumptions of Marginal Productivity Theory:

The assumptions of marginal productivity theory are as follows:

- i. Perfect competition in product market:
- ii. Perfect competition in factor market:
- iii. Homogeneity of factors:
- iv. Substitutability of factors:
- v. Divisible factors-divided in small parts.
- vi. Maximum profit:
- vii. Full employment-the supply of a factor of production is fixed in quantity.
- viii. Variable input coefficient(organization can use the factors of production in different quantities-the quantity of a factor can be changed, while keeping the other factors constant).
- ix. Same state(constant) of technology:

# Modern Theory of Distribution

- It is known as the **demand and supply theory of distribution**.
- According to this theory, the **equilibrium factor prices** can be explained by the forces of **demand and supply**.
- **Prices paid for productive services** are like any other price and they are basically determined by **demand and supply conditions**.
- Wages are payments for the services rendered by labour.
- Rents are payments for the services of land and interest is payment for the services of capital.
- **This theory is superior** to the marginal productivity theory, because it takes into account both the **forces of demand and supply in the determination of factor prices**.
- Marshall held the view that no separate theory is required to explain factor prices. The principles which govern commodity pricing also govern factor-pricing.
- “The theory of factor prices is just a special case of the theory of price. We **first develop** a **theory of the demand** for factors, **then** a **theory of the supply of factors** and **finally combine them** into a **theory of determination of equilibrium price and quantities**.” Lipsey and Stonier

# Modern Theory of Distribution

## Assumptions:

1. Every producer tries to get maximum profit.
2. Producers have perfect knowledge of the MRP
3. Active competition exists in the factor market.
4. There is active competition among the different units of factors.
5. The state does not intervene to equate the prices of the factor service.

## Demand for Factors of Production:

- The demand for factors of production is **different** from that of the demand for goods.
- The **demand for goods** is **direct** while the **demand for factors of production** is **derived demand**.
- The factors of production are demanded because they assist the process of production.
- **Productivity of a factor** refers to the **contribution made** by it in the process of production.
- If the demand for goods which the factor produces is more, its own demand will also be high and vice-versa. The **elasticity of demand** for industry with identical costs **will be high**.

# Modern Theory of Distribution

## Demand for Factors of Production:

- Fig. shows the possible combinations of factors price and the total demand for it, using which we can draw the demand curve DD for the whole industry.
- In Figure, the **factor price** is determined by the **quantity of the factor, possibility of substitutes, and elasticity of demand for final product**.
- Thus, the demand for the factor is determined by its marginal revenue productivity.
- **Marginal revenue product (MRP)**, or **marginal value product**, is the **marginal revenue created** due to an addition of one unit of resource.  $MRP = MPP * MR$
- The **total demand for the factor in an industry**, the **demand for the factors by all the firms has to be added**.

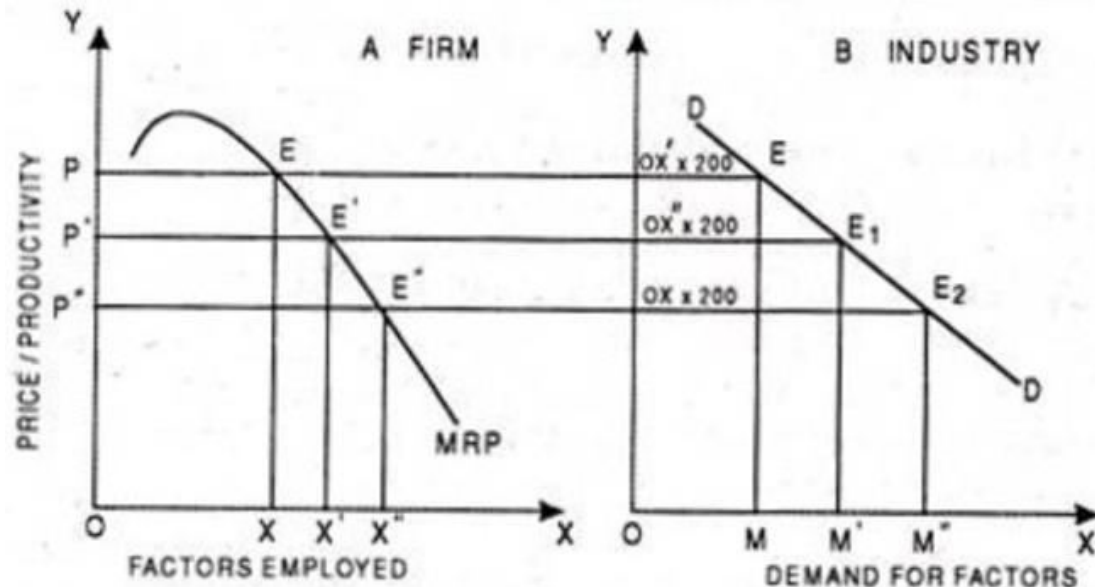


Fig. 7.

# Modern Theory of Distribution

## Factors Affecting Demand:

### (a) The Elasticity of Demand for the Final Product:

- The **demand for the services of a factor will be elastic** if a **slight fall in its price brings about a large responsiveness in its employment**.
- Since the demand for the factor service is a derived demand, the elasticity of demand for the final product will determine the elasticity of demand for the factor service.

### (b) The Amount of Factor Required:

- The **elasticity of demand for the factor service** also **depends** upon the **extent to which the factor service is required in the production** of the commodity.
- If the factor service plays an insignificant role, then, demand for it would be inelastic i.e., demand for the factor service will not be affected by a change in the price.

### (c) Substitutability:

- Elasticity of demand for a factor service also depends upon the extent to which factor service in question can be substituted by other factors “The **greater the ease** with which **factors of production can be substituted** for each other, the more elastic is likely to be the demand for them.

# Modern Theory of Distribution

## Supply of Factors of Production:

- The **supply of goods** **increases with the increase in price**.
- But in the case of factors of production, there exists **no simple relation between** supply and price of factors.
- But for the sake of our convenience, **we presuppose** that there exists the **positive relation** between supply and price. It cannot be unrealistic because the higher prices attract the factors to work more.

## Factors Affecting Supply:

### 1. Supply of Land:

- For an economy, supply of land is **perfectly inelastic**.
- **Supply of land** is **free for an economy** because it has no cost of production.
- But for an **industry, supply of land** depends on **opportunity cost**.
- If opportunity cost of land increases in one industry as compared to another industry then more of it will be used in the former industry than the latter.

# Modern Theory of Distribution

## Factors Affecting Supply:

### 2. Supply of Labour:

- Supply of labor refers to the number of hours for which a laborer is willing to sell his services at a given price.
- There exists **no definite relation** between supply of labour and wage rate.
- Up to a limit supply of labour increases with increase in wage. But after a given level, as the wage rate increases labour prefers leisure to work. In this situation, supply curve becomes backward sloping as seen in fig. 8.

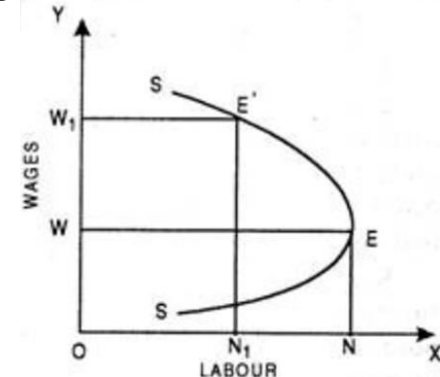


Fig. 8.

### 3. Supply of Capital:

- Supply of capital depends on **savings**. **Price of capital is called interest.**
- According to classical economists, with increase in rate of interest, supply of savings will increase and vice-versa.

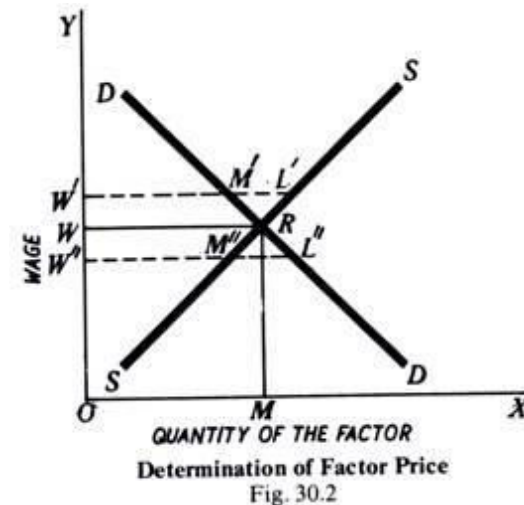
### 4. Supply of Entrepreneur:

- There exists **no definite relation** between supply of entrepreneur and his price. 4
- Besides profits, supply of an entrepreneur depends on many non-economic factors.

# Modern Theory of Distribution

## Interaction of Demand and Supply:

- Both demand curve and the supply curve of a factor of production 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. 30.2, 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.

# Theories of Interest:

## 1. Classical Theory of Interest:

- The theory is also called **saving investment theory of interest** or **demand and supply theory of interest**.
- The theory was propounded and developed by classical economists, namely, Marshall, Pigou, Cassels, Walras, Tausing and Knight.

## Demand for Capital:

- The demand for capital is based on its productivity.
- The demand consists of **consumption and productive** purposes. Capital is demanded because of its productivity.
- Marginal productivity of capital goes on decreasing because of operation of law of variable proportions.
- A producer demands for capital or saving and reward is paid for the use of capital or saving in the form of interest.

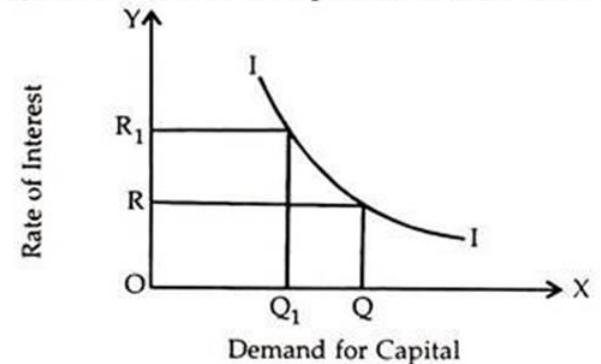
# Theories of Interest:

## 1. Classical Theory of Interest:

- An entrepreneur employs capital to the point where the **rate of interest is equal to the productivity of capital**.
- There is **inverse relationship** between the **rate of interest and demand for capital**.
- Higher the rate of interest lower will be the demand for capital and lower the rate of interest higher will be the demand for capital.

It can be shown from the following diagram:

Diagram 1 : Demand for Capital (Investment Schedule)



- The diagram shows II is the investment schedule or demand for capital. Rate of interest and demand for capital are shown on OY-axis and OX-axis respectively.
- When the rate of interest is OR the demand for capital is OQ and when interest increases the demand for capital decreases from OQ to OQ<sub>1</sub>.
- Thus, there is inverse relationship between the rate of interest and the demand for capital.

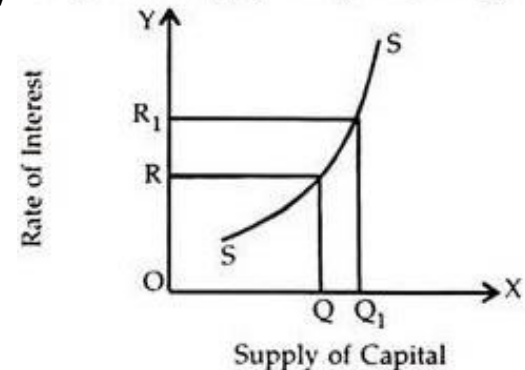
# Theories of Interest:

## 1. Classical Theory of Interest:

### Supply of Capital:

- The supply of capital depends upon the **savings in the society**.
- Savings are from individuals, firms and government. Savings are affected by several factors, namely, **level of income, standard of living, attachment to family, law and order, security of life and property, political stability, etc.**
- There is a **direct relationship** between the rate of interest and supply of capital or saving.
- Higher the rate of interest higher will be the rate of supply interest lower will be the supply of capital.

Diagram 2 : Supply of Capital (Saving Schedule)



- Rate of interest is shown on OY-axis and supply of capital or savings on OX-axis respectively.
- SS is the saving schedule or supply of capital. When rate of interest is OR the supply of capital is OQ.
- When it increases from OR to OR1 the supply of capital or savings also increases from OQ to OQ1. It means there is direct relationship between rate of interest and supply of capital.

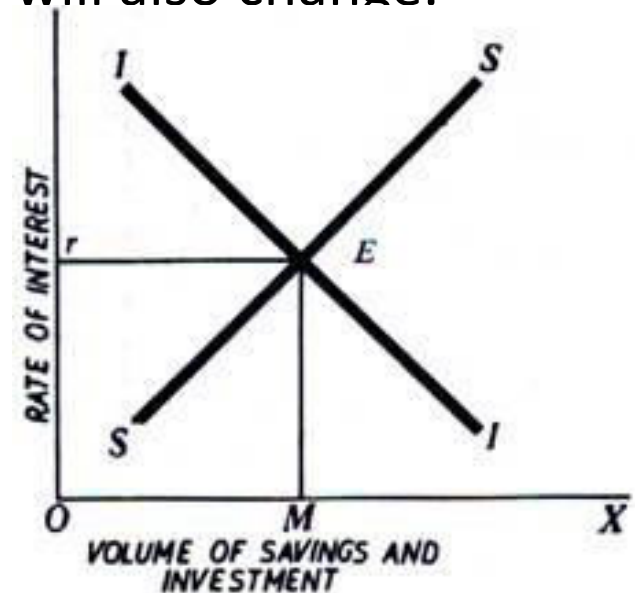
# 1. Classical Theory of Interest:

## Equilibrium between Demand and Supply:

- The rate of interest is determined by the interaction of the forces of demand for capital (or investment) and the supply of savings.
- The rate of interest at which the demand for capital (or demand for savings to invest in capital goods) and the supply of savings are in equilibrium, will be the rate determined in the market.
- The way in which the rate of interest is determined by demand for investment and supply of savings is shown in Fig. 34.2, in which SS is the supply curve of savings and I-I is the demand curve of savings to invest in capital goods (I-I is also called demand curve for investment or simply investment demand curve).

# 1. Classical Theory of Interest:

- The demand for investment and supply of savings are in equilibrium at  $r$  rate of interest where the curves intersect each other. Hence  $r$  is the equilibrium rate of interest which will come to stay in the market. In this equilibrium position,  $OM$  amount of savings is lent, borrowed and invested.
- If any change in the demand for investment and/or supply of savings comes about, the curves will shift accordingly and, therefore, the equilibrium rate of interest will also change.



Rate of Interest

Fig. 34.2

# Theories of Interest:

**2. Loanable Funds Theory of Interest:**-propounded by Wicksell, Ohlin Robinson and A.C. Pigou. It is an improvement on the classical theory of interest. It is also called neo-classical theory of interest.

- According to this theory the rate of interest is determined by the **demand for loanable funds and the supply of loanable funds**(loans, bonds, or savings deposits).

## **Demand for Loanable Funds:**

### **(1) Investment Demand:**

- Investment is needed for capital goods and other infrastructures.
- **Interest is the cost** for the **demand for loanable funds**.
- An entrepreneur invests capital to that point where the **rate of interest is equal to the marginal productivity of capital** as with the increase in capital investment the marginal productivity of capital declines.

### **(2) Dissaving:**

- When **expenditure is more than the current income** then it is called **dissaving**.
- More expenditure on consumption is done than the current income by the people will lead to negative savings.
- Loanable funds are demanded by such consumers who are spending more than their current incomes.
- **Lower the rate of interest higher will be the demand for loanable funds** and contrary to it, on the higher rate of interest they will be discouraged to borrow.

# Theories of Interest:

## 2. Loanable Funds Theory of Interest:

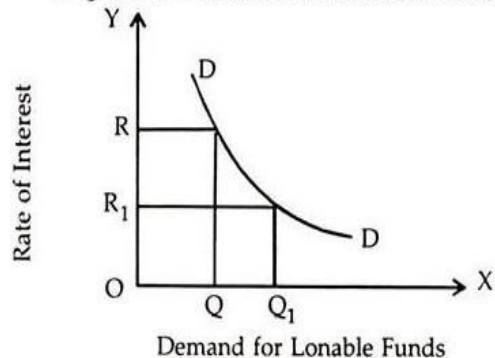
### Demand for Loanable Funds:

#### (3) Demand for Hoarding:

- People would like to hoard money or wealth and they demand for loanable funds. Such hoardings can be used for investment in shares and debentures.
- Lower the rate of interest higher will be the demand for such loanable funds and vice versa.

Thus the demand for loanable funds can be shown by the following diagram:

Diagram 4 : Demand for Loanable Funds



- When the rate of interest is OR the demand for loanable funds is OQ.
- When the rate of interest decreases from OR to OR<sub>1</sub> the demand increases from OQ to O<sub>1</sub>. It means there is **inverse relationship** between the rate of interest and demand for loanable funds.

# Theories of Interest:

## 2. Loanable Funds Theory of Interest:

### Supply of Loanable Funds:

#### (1) Saving:

- The most important source of supply of loanable funds is saving. Saving = (income - consumption).
- Saving depend on the **level of income of individuals, households and the government.**
- There is **direct relationship** between the **rate of interest and rate of savings.**
- Higher the rate of interest people will save more and vice versa.

#### (2) Disharding:

- When hoarded money or wealth is used for the consumption and investment purposes it is called **disharding.**
- When rate of interest is high people will be encouraged to dishoard their savings and it will increase the supply of loanable funds. Contrary to it, people will not use disharding and the supply of loanable funds will not increase.

#### (3) Bank Credit:

- The supply of loanable funds is also increased by expansion or contraction of bank credit.
- Higher the rate of interest more will be the bank credit available and loanable funds will increase in supply.

# Theories of Interest:

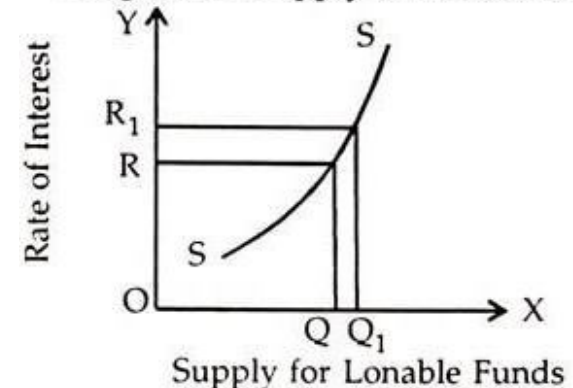
## 2. Loanable Funds Theory of Interest:

### Supply of Loanable Funds:

#### (4) Disinvestment:

- It means the **withdrawal of the amount invested** by the entrepreneurs and investors.
- When the disinvestment takes place the **supply of loanable funds will increase** and it will be only possible **when the rate of interest is high**.
- If the rate of return on investment is low then the invested capital is withdrawn and it will increase the supply of loanable funds.

Diagram 5 : Supply of Loanable Funds



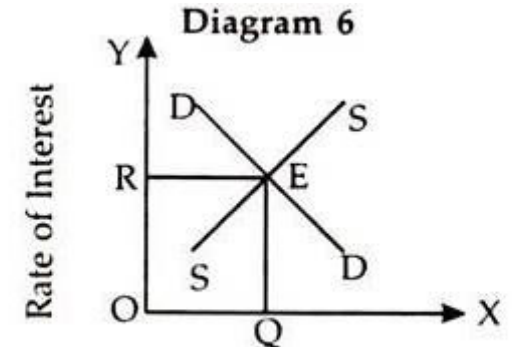
- SS is the supply of loanable funds and the rate of interest and the supply of such funds have direct relationship.
- It the rate of interest is OR the supply of loanable funds is OQ.
- With the increase in the rate of interest from OR to OR<sub>1</sub> the supply of loanable funds increases from OQ to OQ<sub>1</sub>.

# Theories of Interest:

## 2. Loanable Funds Theory of Interest:

### Determination of the Rate of Interest:

- The equilibrium rate of interest will be determined at the point where the demand curve for loanable funds cuts the supply curve of loanable funds .



Demand and Supply of Loanable Funds

- Demand for loanable funds (DD) and supply of loanable funds (SS) are shown on OX-axis while the rate of interest is shown on OY- axis.
- The point of equilibrium is at E where the rate of interest is OR and the demand for loanable funds is equal to its supply (OQ).

# Theories of Interest:

## 3. Liquidity Preference Theory of Interest:

- J.M. Keynes has propounded liquidity preference theory.
- According to this theory, “**Interest** is the **reward for parting with liquidity** for a specific period.” In other words, it can be said that interest is the reward for parting with liquidity.

Professor J.M. Keynes has rightly pointed out, “It is the **price which equilibrate the desire to hold wealth in the form of cash** with the available quantity of cash.” In short period the supply of money remains constant whiles the demand for money keeps on changing.

According to this theory the **rate of interest is determined by the demand for liquidity and supply of liquidity**. The theory is also called the **monetary theory of interest**.

### Meaning of Liquidity Preference:

- **Wealth** is generally preferred to be **kept in cash** in any society. Most liquid form of wealth and income is cash or money. It can be used for any purpose and there is no difficulty and it will be a facility to use the income at desire.
- Income or wealth can be kept in the form of land, building, shares, debentures, government securities, etc., but it cannot be used in the form of money or cash.
- If in any society people prefer to keep their income in the form of liquidity then we have to pay higher rate of interest. People will be prepared to part with liquidity when they are paid higher rate of interest. When the rate of interest is low they will prefer to keep it in liquid form. Thus, interest is a reward for parting with liquidity. Hence higher the liquidity preference higher will be the rate of interest and lower the liquidity preference lower will be the rate of interest.

# Theories of Interest:

## 3. Liquidity Preference Theory of Interest:

### Motives for Liquidity Preference:

#### (1) Transaction Motive:

- All the persons are required to keep a part of their income in cash in order to **purchase goods and services of daily use.**
- The demand for such motive is called **transaction demand for liquidity** for meeting their day-to-day needs of their life.
- The demand for liquidity for transaction motive depends upon the level of income and employment, time lag in income and expenditure in a country. The changes in incomes of the people bring changes in the demand for liquidity for transaction motive.

#### (2) Precautionary Motive:

- Another demand for money is from people **to meet unforeseen events of life.**
- Each person or businessman has to keep a part of his income in liquid form to meet the emergency requirements like sickness, accident, unemployment and other emergency requirements.

#### (3) Speculative Motive:

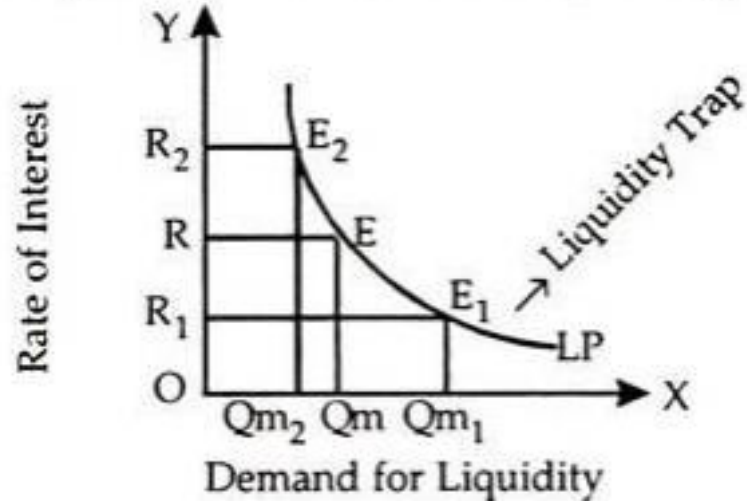
- According to Keynes, “Speculative motive is **for securing profit** from knowing better than the market what the future will bring forth.”
- People keep a part of their income in liquid form or cash in order to earn the profit by investing it in shares, debentures, bonds, government securities and making loans and advances to individuals, businessmen and traders.

# Theories of Interest:

## 3. Liquidity Preference Theory of Interest:

### Demand for Liquidity:

Diagram 7 : Demand for Money or Liquidity



- Rate of interest is shown on OY-axis and the demand for liquidity or money is shown on OX-axis. LP is the demand for liquidity preference.
- There is inverse relationship between the rate of interest and demand for liquidity preference.
- Higher the rate of interest higher will be the demand for liquidity preference and lower the rate of interest higher will be the demand for liquidity preference.
- When the rate of interest is OR the demand of liquidity is OQm. When the rate of interest increases from OR to OR2 the demand for liquidity is reduced from OQm to OQm2 and with the fall in the rate of interest to OR1 the demand for liquidity increases to OQm1. There is liquidity trap when the rate of interest is so low that people would not like to make loans and advances because it is not profitable.

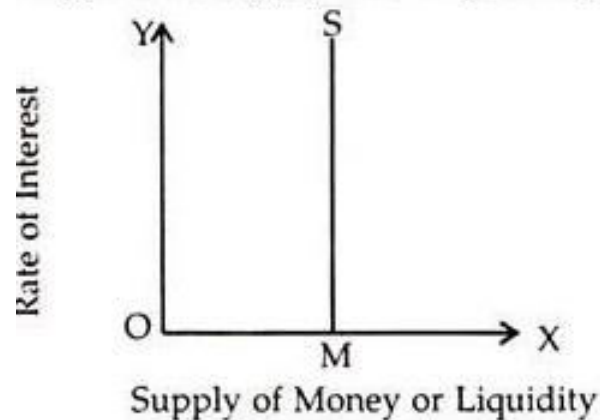
# Theories of Interest:

## 3. Liquidity Preference Theory of Interest:

### Supply of Liquidity or Money:

- Supply of money consists of coins, paper currency and bank credit. It increases the supply of liquidity in an economy during a given period.
- The supply of money remains constant because it depends upon the monetary authority of a country. Thus, the quantity of money issued by the central bank and its credit policy are the determinants of money supply in the country. It is assumed constant.

Diagram 8 : Supply of Money or Liquidity



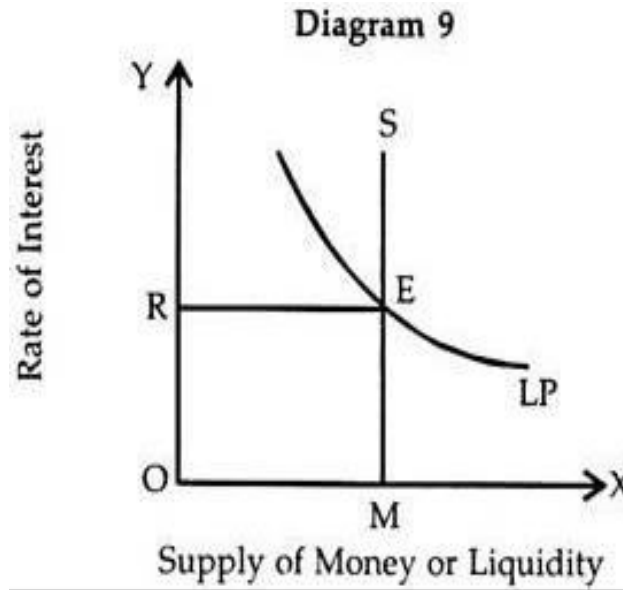
Thus, the rate of interest during a given period has no effect on the supply of money or liquidity.

# Theories of Interest:

## 3. Liquidity Preference Theory of Interest:

### Determination of the Rate of Interest:

- According to Keynesian theory of interest, **the rate of interest will be determined** at the point where the **demand for liquidity (LP) curve cuts the supply of money (SM) curve** as shown in the diagram-

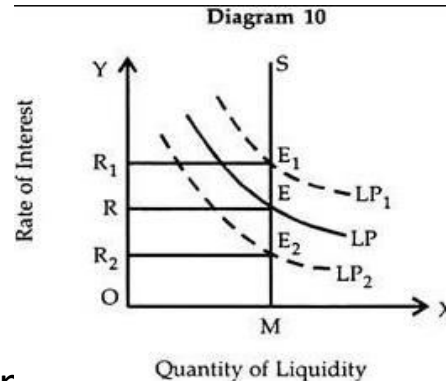


- In the diagram rate of interest is shown on OY-axis and quantity of liquidity (demand for and supply of money of liquidity) on the OX-axis. OR is the rate of interest and OM is the quantity of liquidity, E is the point of equilibrium where the LP cuts the SM curve. LP shows the demand for liquidity and SM shows the supply of money or liquidity.
- Now we will see the effects on the rate of interest due to change in the demand for liquidity (LP) keeping supply of liquidity (SM) constant and change in supply of liquidity keeping the demand for liquidity constant.

### 3. Liquidity Preference Theory of Interest:

#### Determination of the Rate of Interest:

When the demand for liquidity changes keeping the supply of liquidity constant the change in LP and the rate of interest will move in the same direction as given in Diagram 10.



The initial rate of interest is determined at point E where the LP curve cuts the SM curve. OR is the rate of interest and OM is the quantity of liquidity. When the demand for liquidity increases the LP curve will shift to the right side of the original LP curve and the point of equilibrium will be at E1 where OR1 is the rate of interest keeping supply of liquidity (SM) constant.

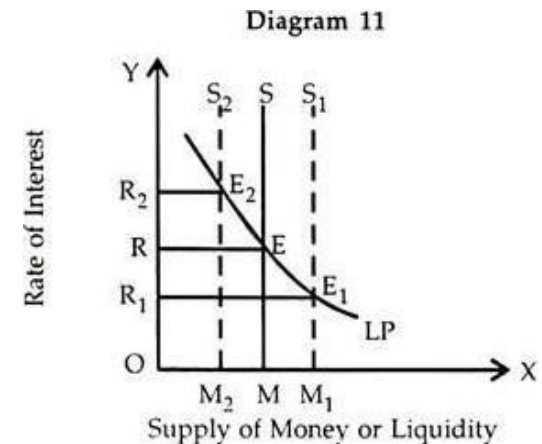
When the demand for liquidity decreases the LP curve will move downward to the left of the original LP curve and the point of equilibrium will be at E2 where the rate of interest is OR2 and the quantity of liquidity is OM.

Thus there is direct and positive relation between the liquidity preference (demand for liquidity) and the rate of interest. With the increase in the LP the rate of interest will increase and with the decrease in LP the rate of interest will decrease.

### 3. Liquidity Preference Theory of Interest:

#### Determination of the Rate of Interest:

When the demand for liquidity (LP) remains constant and the supply of liquidity (SM) changes the relationship between supply of liquidity and rate of interest will be inverse. With the increase in the supply of liquidity (SM) the rate of interest will fall and with the decrease in supply of liquidity the rate of interest will increase as shown in the following diagram-



- The original equilibrium is E where LP curve cuts the SM curve and OR is the rate of interest and OM is the quantity of liquidity. When the supply of liquidity increases the SM curve shifts to right and the point of equilibrium is at E1 where LP cuts the S1M1 curve, OR1 is the rate of interest and the quantity of liquidity is OM1.
- Contrary to it when the supply of liquidity decreases the SM curve shifts towards the left side of the original supply curve (SM) and the point of equilibrium is attained at point E2 where the LP curve cuts the S2M2 and the rate of interest is determined OR2 and the quantity of liquidity is OM2. Thus, there is inverse relation between supply of liquidity and the rate of interest. The rate of interest will increase with the increase in demand for liquidity keeping the supply of liquidity constant.

# The Accelerator Theory of Investment:

- This theory is based upon the notion that a **particular amount of capital stock is necessary to produce a given output.**
- **Capital stock** is the **maximum amount of common and preferred shares** that a company is **authorized to issue**—recorded on the balance sheet under shareholders' equity.

For example, a capital stock of Rs. 400 billion may be required to produce Rs. 100 billion of output. This implies a fixed relationship between the capital stock and output.

Thus,  $X = K_t / Y_t$

where  $x$  is the ratio of  $K_t$ , the economy's capital stock in time period  $t$ , to  $Y_t$ , its output in time period  $t$ .

The relationship may also be written as

$$K_t = xY_t \dots(i)$$

If  $x$  is constant, the same relationship held in the previous period; hence

$$K_{t-1} = xY_{t-1} \dots(ii)$$

By subtracting equation (ii) from equation (i), we obtain

$$K_t - K_{t-1} = xY_t - xY_{t-1} = x(Y_t - Y_{t-1}) \dots(ii)$$

# The Accelerator Theory of Investment:

- **Net investment** equals the **difference between the capital stock in time period t and the capital stock in time period t – 1,**.
- Net investment equals x multiplied by the change in output from time period t – 1 to time period t.
- **Net investment** equals **gross investment minus capital consumption allowances or depreciation.**
- If  $I_t$  represents **gross investment in time period t** and  $D_t$  represents **depreciation in time period t**, net investment in time period t equals  $I_t - D_t$  and  **$I_t - D_t = x (Y_t - Y_{t-1}) = x \Delta Y$ .**
- Consequently, **net investment** equals **x**, the accelerator coefficient, multiplied by the change in output.
- Since x is assumed constant, investment is a function of changes in output. If output increases, net investment is positive.
- If output increases more rapidly, new investment increases.
- From an economic standpoint, the reasoning is straightforward.
- According to the theory, a particular amount of capital is necessary to produce a given level of output.

# The Accelerator Theory of Investment:

- For example, suppose Rs. 400 billion worth of capital is necessary to produce Rs. 100 billion worth of output.

$$X = 400/100 = 4.$$

- If aggregate demand is Rs. 100 billion and the capital stock is Rs. 400 billion, output is Rs. 100 billion. So long as aggregate demand remains at the Rs. 100 billion level, net investment will be zero, since there is no incentive for firms to add to their productive capacity.
- Gross investment, however, will be positive, since firms must replace plant and equipment that is deteriorating.
- Suppose **aggregate demand increases to Rs. 105 billion**. If **output** is to **increase to the Rs. 105 billion** level, the economy's **capital stock** must **increase to the Rs. 420 billion** level. This follows from the assumption of a fixed ratio,  $x$ , between capital stock and output.
- For **production to increase to the Rs. 105 billion** level, **net investments must equal Rs. 20 billion**, the **amount necessary to increase the capital stock to the Rs. 420 billion level**.
- Since  $x = 4$  and the change in output = Rs. 5 billion, this amount, Rs. 20 billion, may be obtained directly by multiplying  $x$ , the accelerator coefficient, by the change in output.
- Had the increase in output been greater, (net) investment would have been larger, which implies that **(net) investment is positively related to changes in output**.

# The Accelerator Theory of Investment:

## Criticisms accelerator theory of investment:

- **First**, the theory explains net but not gross investment. For many purposes, including the determination of the level of aggregate demand, gross investment is the relevant concept.
- **Second**, the theory assumes that a discrepancy between the **desired and actual capital stocks** is eliminated within a single period.
- If industries producing capital goods are already operating at full capacity, it may not be possible to eliminate the discrepancy within a single period. In fact, even if the industries are operating at less than full capacity it may be more economical to eliminate the discrepancy gradually.
- **Third**, since the theory assumes **no excess capacity, we would not expect it to be valid in recessions**, since they are characterized by excess capacity. Based on the theory, net investment is positive when output increases. But if excess capacity exists, we would **expect little or no net investment to occur**, since net investment is made in order to increase productive capacity.
- **Fourth**, the accelerator theory of investment, assumes a **fixed ratio between capital and output**. This assumption is occasionally justified, but most firms can substitute labor for capital, at least within a limited range. As a consequence, firms must take into consideration other factors, such as the interest rate.

# The Accelerator Theory of Investment:

## Criticisms accelerator theory of investment:

- **Fifth**, even if there is a **fixed ratio between capital and output and no excess capacity**, firms will invest in new plant and equipment in response to an increase in aggregate demand only if demand is expected to remain at the new, higher level.
- In other words, if managers expect the **increase in demand** to be temporary, they may maintain their present levels of output and raise prices (or let their orders pile up) instead of increasing their productive capacity and output through investment in new plant and equipment.
- Finally, if and when an expansion of productive capacity appears warranted, the expansion may not be exactly that needed to meet the current increase in demand, but one sufficient to meet the increase in demand over a number of years in the future.

## Criticism:

- Piecemeal expansion of facilities in response to short-run increases in demand may be uneconomical or, depending upon the industry, even technologically impossible. A steel firm cannot, for example, add half a blast furnace. In view of these and other criticisms of the accelerator theory of investment, it is not surprising that early attempts to verify the theory were unsuccessful.

# The Accelerator Theory of Investment:

## Assumptions:

The acceleration principle is based on three main assumptions:

1. First, investment has both autonomous and induced components.
2. Investment depends not on the absolute level of output or demand but on the rate of increase in NNP or in total demand.  
  
If the rate of increase is growing, investment spending will increase; if the rate of income is stable, investment will be constant; if the rate of increase declines, investment will fall.
3. The acceleration principle also emphasises the extreme volatility of investment as compared with other components of aggregate demand. It suggests that any percentage change in aggregate demand may result in much larger percentage changes in investment spending.

# Economics for Managers

## The Internal Funds Theory of Investment



# The Internal Funds Theory of Investment :

- Under this theory, the **desired capital stock** and, hence, **investment depends on the level of profits**.
- Several different explanations have been offered. Jan Tinbergen, for example, has argued that **realized profits** accurately **reflect expected profits**.
- Since **investment presumably depends on expected profits**, **investment is positively related** to realized profits.
- Alternatively, it has been argued that **managers have a decided preference for financing investment internally**.

Firms may obtain funds for investment purposes from a variety of sources:

- (1) Retained earnings,
- (2) Depreciation expense (funds set aside as plant and equipment depreciate),
- (3) Various types of borrowing, including sale of bonds,
- (4) The sale of stock.

# The Internal Funds Theory of Investment :

- **Retained earnings and depreciation expense** are **sources of funds internal** to the firm; the other sources are external to the firm.
- Borrowing commits a firm to a series of fixed payments. Should a recession occur, the firm maybe unable to meet its commitments, **forcing it to borrow or sell stock on unfavorable terms or even forcing it into bankruptcy.**
- Consequently, firms may be **reluctant to borrow except** under **very favorable circumstances.**
- Similarly, firms may be **reluctant to raise funds by issuing new stock.**
- Management, for example, is often concerned about its earnings record on a per share basis. Since an **increase in the number of shares outstanding tends to reduce earnings on a per share basis,** management may be **unwilling to finance investment by selling stock unless the earnings from the project clearly offset** the effect of the increase in shares outstanding.
- Similarly, management may **fear loss of control** with the sale of additional stock.
- For these and other reasons, proponents of the internal funds theory of investment argue that **firms strongly prefer to finance investment internally and that the increased availability of internal funds through higher profits generates additional investment.** Thus, according to the internal funds theory, investment is determined by profits.

# The Internal Funds Theory of Investment :

- According to the internal funds theory, **policies designed to increase profits** directly are likely to be the most effective.
- These policies include reductions in the corporate income tax rate, allowing firms to depreciate plant and equipment more rapidly, thereby reducing their taxable income, and allowing investment tax credits, a device to reduce firms' tax liabilities.
- On the other hand, **increases in government purchases or reductions in personal income tax rates** will have **no direct effect** on **profits, hence no direct effect on investment**.
- To the extent that **output increases** in response to **increases in government purchases or tax cuts, profits increase**. Consequently, there will be an **indirect effect on investment**.
- In contrast, under the accelerator theory of investment, **policies designed to influence investment directly under the internal funds theory will be ineffective**.
- For example, a **reduction** in the **corporate tax rate will have little or no effect on investment** because, under the accelerator theory, **investment depends on output, not the availability of internal funds**.
- On the other hand, **increases in government purchases or reductions in personal income tax rates will be successful in stimulating investment** through their impact on aggregate demand, hence, output.
- At the same time, they maintain that **internal funds** are an important determinant of investment, particularly during recessions.

# The Neoclassical Theory of Investment

- The theoretical basis for the neoclassical theory of investment is the neoclassical theory of the optimal accumulation of capital. Since the theory is both long and highly mathematical, we shall not attempt to outline it. Instead, we shall briefly examine its principal results and policy implications.
- According to the neoclassical theory, the desired capital stock is determined by output and the price of capital services relative to the price of output. The price of capital services depends, in turn, on the price of capital goods, the interest rate, and the tax treatment of business income. As a consequence, changes in output or the price of capital services relative to the price of output alter the desired capital stock, hence, investment.
- As in the case of the accelerator theory, output is a determinant of the desired capital stock. Thus, increases in government purchases or reductions in personal income tax rates stimulate investment through their impact on aggregate demand, hence, output. As in the case of the internal funds theory, the tax treatment of business income is important.



**MACROECONOMIC ANALYSIS AND  
POLICY**

**MODULE 6**



## National Income- Definition

- According to **Marshall**: “The **labor and capital** of a country **acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial** including services of all kinds. This is the **true net annual income or revenue** of the country or national dividend.”
- Due to the varied category of goods and services, a correct estimation is very difficult. There is a chance of double counting, hence National Income cannot be estimated correctly.
- For example, a product runs in the supply from the producer to distributor to wholesaler to retailer and then to the ultimate consumer. If on every movement commodity is taken into consideration then the value of National Income increases.

# National income

## National Income- Definition

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- In the words of **Pigou**—”National income or National Dividend is that part of objective income of the community including of course income derived from abroad which can be measured in money.”

## Features of National Income:

- (i) It is measured on one year basis,
- (ii) It includes the values of goods and services,
- (iii) It includes only those things which are produced by labour and capital of a country with the help of the natural resources,
- (iv) It excludes the depreciation and debasement of capital goods,
- (v) It includes the net foreign investment in the country,
- (vi) It excludes all those goods and services which are produced by friends, relatives or organisations free of costs.

Following are the Modern National Income definition

- GDP
- GNP

# Gross Domestic Product

- Gross domestic product (GDP) is the **total monetary or market value of all the finished goods and services** produced within a country's borders in a specific time period.
- As a broad measure of overall domestic production, it functions as a **comprehensive scorecard** of a given **country's economic health**. Though GDP is typically calculated on an annual basis, it is sometimes calculated on a quarterly basis as well.

Further, GDP is calculated at market price and is defined as GDP at market prices. Different constituents of GDP are:

Wages and salaries

Rent

Interest

Undistributed profits

Mixed-income

Direct taxes

Dividend

Depreciation

## Types of GDP:

GDP can be measured in several different ways. The most common methods include:

**Nominal GDP** – the total value of all goods and services produced at current market prices. This includes all the changes in market prices during the current year due to inflation or deflation.

**Real GDP** – the sum of all goods and services produced at constant prices. The prices used in determining the Gross Domestic Product are based on a certain base year or the previous year. This provides a more accurate account of economic growth, as it is already an inflation-adjusted measurement, meaning the effects of inflation are taken out.

**Actual GDP** – real-time measurement of all outputs at any interval or any given time. It demonstrates the existing state of business of the economy.

**Potential GDP** – ideal economic condition with 100% employment across all sectors, steady currency, and stable product prices.

## Methods of measuring GDP:

### 1. Expenditure Approach

The expenditure approach is the most commonly used GDP formula, which is based on the money spent by various groups that participate in the economy.

$$\blacksquare \text{ GDP} = \text{C} + \text{G} + \text{I} + \text{NX}$$

C = consumption or all private consumer spending within a country's economy, including, durable goods (items with a lifespan greater than three years), non-durable goods (food & clothing), and services.

G = total government expenditures, including salaries of government employees, road construction/repair, public schools, and military expenditure.

I = sum of a country's investments spent on capital equipment, inventories, and housing.

NX = net exports or a country's total exports less total imports.

## Methods of measuring GDP:

### 2. Income Approach

This GDP formula takes the total income generated by the goods and services produced.

- **GDP = Total National Income + Sales Taxes + Depreciation + Net Foreign Factor Income**

Total National Income – the sum of all wages, rent, interest, and profits.

Sales Taxes – consumer taxes imposed by the government on the sales of goods and services.

Depreciation – cost allocated to a tangible asset over its useful life.

Net Foreign Factor Income – the difference between the total income that a country's citizens and companies generate in foreign countries, versus the total income foreign citizens and companies generate in the domestic country.

## Gross National Product

- Gross National Product (GNP) is the **total value of all finished goods and services produced by a country's citizens** in a given financial year, irrespective of their location.
- GNP also measures the **output generated** by a country's **businesses located domestically or abroad**. It can be defined as a piece of economic statistic that comprises Gross Domestic Product (GDP), and income earned by the residents from investments made overseas.
- Simply put, **GNP is a superset of the GDP**. While **GDP** confines its **analysis of the economy to the geographical borders** of the country, **GNP** extends it to also **take account of the net overseas economic activities performed by its residents**.
- Basically, GNP signifies **how a country's people contribute to its economy**. It considers citizenship, regardless of the location of the ownership.

## Gross National Product

- GNP does not include **foreign residents' income earned within the country.**
- GNP also does not count any **income earned in India by foreign residents or businesses, and excludes products manufactured in the country by foreign.**
- For calculation of GNP, we need to collect and assess the data from all productive activities, such as agricultural produce, wood, minerals, commodities, the contributions to production by transport, communications, insurance companies, professions such (as lawyers, doctors, teachers, etc.), at market prices.

It also includes net income arising in a country from abroad. Four main constituents of GNP are:

- Consumer goods and services
- Gross private domestic income
- Goods produced or services rendered
- Income arising from abroad.

## Method of calculating GNP:

The official formula for calculating GNP is as follows:

$$\blacksquare \quad Y = C + I + G + X + Z$$

Where:

C – Consumption Expenditure; I – Investment; G – Government Expenditure; X – Net Exports (Value of imports minus value of exports); Z – Net Income (Net income inflow from abroad minus net income outflow to foreign countries)

Alternatively, the Gross National Product can also be calculated as follows:

$$\blacksquare \quad \text{GNP} = \text{GDP} + \text{Net Income Inflow from Overseas} - \text{Net Income Outflow to Foreign Countries}$$

Where:

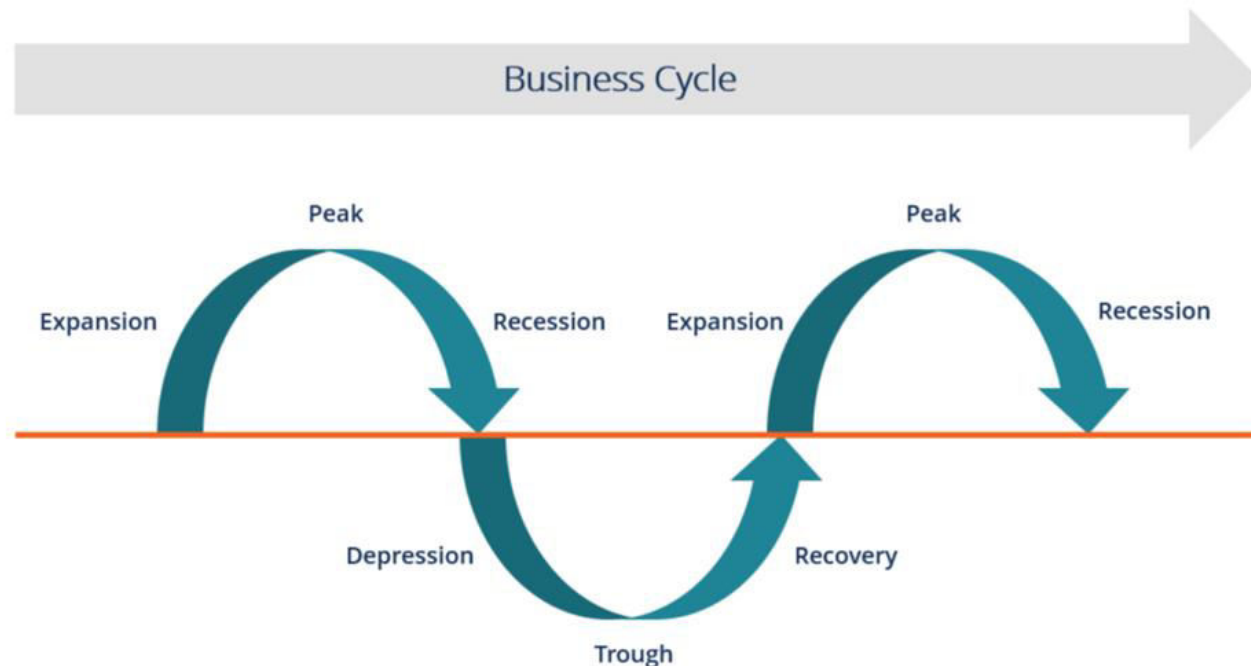
- $\text{GDP} = \text{Consumption} + \text{Investment} + \text{Government Expenditure} + \text{Exports} - \text{Imports}$
- Gross National Product takes into account the manufacturing of tangible goods such as vehicles, agricultural products, machinery, etc., as well as the provision of services like healthcare, business consultancy, and education.
- GNP also includes taxes and depreciation. The cost of services used in producing goods is not computed independently since it is included in the cost of finished products.



# **BUSINESS CYCLES**

## MODULE 6

- **"Business cycles"** -fluctuation found in the aggregate economic activity of nation.
- A cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions...this sequence of changes is recurrent but not periodic." That description, from the 1946 magnum opus by Arthur F. Burns and Wesley C. Mitchell.
- **Business cycles** are marked by the **alternation of the phases of expansion and contraction in aggregate economic activity, and the co-movement among economic variables** in each phase of the cycle.
- Aggregate economic activity is represented by not only real (i.e., inflation-adjusted) GDP—a measure of aggregate output—but also the aggregate measures of industrial production, employment, income, and sales, which are the key coincident economic



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- Aggregate economic activity is represented by not only real (i.e., inflation-adjusted) GDP—a measure of aggregate output—but also the aggregate measures of industrial production, employment, income, and sales, which are the key coincident economic indicators.
- A **business cycle** is completed when it goes through a **single boom and a single contraction in sequence**.
- The time period to complete this sequence is called the **length of the business cycle**.
- A **boom** is characterized by a **period of rapid economic growth** whereas a **period of relatively stagnated economic growth** is a **recession**. These are **measured** in terms of the **growth of the real GDP**, which is **inflation-adjusted**.

## Stages of the Business Cycle:

In the diagram above, the straight line in the middle is the steady growth line. The business cycle moves about the line.

### 1. Expansion

- The first stage in the business cycle is expansion. **Expansion** is the phase of the business cycle **where real gross domestic product (GDP) grows for two or more consecutive quarters**, moving from a trough to a peak.
- In this stage, there is an **increase in positive economic indicators** such as **employment, income, output, wages, profits, demand, and supply of goods and services**.
- Debtors are generally paying their debts on time, the velocity of the money supply is high, and investment is high. This process continues as long as economic conditions are favourable for expansion.

# Stages of the Business Cycle:

## 2. Peak

- The economy then **reaches a saturation point, or peak**, which is the second stage of the business cycle.
- A peak is the **highest point between the end of an economic expansion and the start of a contraction** in a business cycle.
- The peak refers to the **last month before several key economic indicators, such as employment and new housing starts, begin to fall.**
- It is at this point **real GDP spending** in an economy is at its **highest level.**
- The peak is the pinnacle of the business cycle and its opposite is the trough, which represents the lowest point in a business cycle.
- The maximum limit of growth is attained. The economic indicators do not grow further and are at their highest. Prices are at their peak. This stage marks the reversal point in the trend of economic growth. Consumers tend to restructure their budgets at this point.

# Stages of the Business Cycle:

## 3. Recession

- The recession is the stage that follows the peak phase. A **recession** is a macroeconomic term that refers to a **significant decline in general economic activity** in a designated region.
- It had been typically recognized as **two consecutive quarters of economic decline**, as reflected by GDP in conjunction with monthly indicators such as a rise in unemployment.
- However, the National Bureau of Economic Research (NBER), defines a recession as a **significant decline in economic activity spread across the economy, lasting more than a few months**, normally visible in **real GDP, real income, employment, industrial production, and wholesale-retail sales**.
- The demand for goods and services **starts declining rapidly and steadily** in this phase.
- Producers do not notice the **decrease in demand instantly and go on producing, which creates a situation of excess supply** in the market.
- Prices tend to fall. All positive economic indicators such as income, output, wages, etc., consequently start to fall.

# Stages of the Business Cycle:

## 4. Depression

- A depression is a **severe and prolonged downturn** in economic activity.
- In economics, a **depression** is commonly defined as an **extreme recession that lasts three or more years or which leads to a decline in real gross domestic product (GDP) of at least 10%**. in a given year.
- Depressions are **relatively less frequent than milder recessions, and tend to be accompanied by high unemployment and low inflation**. There is a commensurate rise in unemployment.
- The **growth in the economy continues to decline**, and as this **falls below the steady growth line**, the stage is called a depression.

## 5. Trough

- A trough, in economic terms, can refer to a **stage in the business cycle where activity is bottoming, or where prices are bottoming, before a rise**.
- In the depression stage, the economy's **growth rate becomes negative**.
- There is further **decline until the prices of factors, as well as the demand and supply of goods and services, contract to reach their lowest point**.
- The economy eventually reaches the trough. It is the negative saturation point for an economy. There is extensive depletion of national income and expenditure.

# Stages of the Business Cycle:

## 6. Recovery

- Economic recovery is the business cycle stage following a recession that is characterized by a sustained period of improving business activity.
- Normally, during an economic recovery, gross domestic product (GDP) grows, incomes rise, and unemployment falls and as the economy rebounds.
- During a recovery, the economy undergoes a process of economic adaptation and adjustment to new conditions, including the factors that triggered the recession in the first place and the new policies and rules rolled out by governments and central banks in response to the recession.
- The labor, capital goods, and other productive resources that were tied up in business that failed and went under during the recession are re-employed in new activities as unemployed workers find new jobs and failed firms are bought up or divided up by others.
- A recovery is the economy healing itself from the damage done, and it sets the stage for a new expansion.

## Stages of the Business Cycle:

- After the trough, the economy moves to the stage of recovery.
- In this phase, there is a **turnaround in the economy, and it begins to recover from the negative growth rate.**
- Demand starts to pick up due to **low prices and, consequently, supply begins to increase.**
- The population develops a **positive attitude towards investment and employment and production starts increasing.**
- Employment begins to rise and, due to accumulated cash balances with the bankers, lending also shows positive signals.
- In this phase, depreciated capital is replaced, leading to new investments in the production process. Recovery continues until the economy returns to steady growth levels.
- This completes one full business cycle of boom and contraction. The extreme points are the peak and the trough.



# KEYNESIAN THEORY OF EMPLOYMENT

## MODULE 6



- According to classicists, there will **always be full employment in a free enterprise capitalist economy** because of the operation of **Say's Law** and **wage-price flexibility**.
- This classical theory came under severe attack during the Great Depression years of 1930s at the hands of J. M. Keynes.
- He **rejected** the **notion of full employment** and instead **suggested full employment** as a special case and not a general case.
- Full employment is a temporary phenomenon, an astrological coincidence! He claimed his theory to be 'general', i.e., applicable at any point of time.
- Keynes' theory of employment is a **demand-deficient theory**.
- This means that Keynes visualized **employment/unemployment** from the **demand side of the model**. His theory is thus known as **demand-oriented approach**.
- According to Keynes, the **volume of employment** in a country depends on the **level of effective demand of the people for goods and services**.
- **Unemployment** is **attributed** to the **deficiency of effective demand**.
- It is to be kept in mind that Keynes' theory is a **short run theory when population, labour force, technology, etc., do not change**.
- One can argue that the volume of employment depends on the level of national income/output.
- Higher (lower) the level of national output, higher (lower) is the volume of employment. Thus, this theory is also the **theory of income determination**.

# Meaning of Effective Demand

- Keynes' theory of employment is based on the **principle or level of effective demand**.
- Thus, **unemployment** is attributed to the **deficiency of effective demand** and to **cure** it requires the **increasing of the level of effective demand**.
- By **'effective' demand**, Keynes meant the **total demand for goods and services in an economy at various levels of employment**. **Total demand for goods and services** by the people is the **sum total of all demand meant for consumption and investment**. In other words, the sum of consumption expenditures and investment expenditures constitute effective demand in a two-sector economy.
- In order to meet such demand, **people are employed to produce all kinds of goods, both consumption goods and investment goods**. However, to complete our discussion on effective demand we need another component of effective demand—the component of government expenditure. Thus, effective demand may be defined as the total of all expenditures, i.e.,
  - **C + I + G**
  - Where, C, I and G stand for consumption, investment, and government expenditures.
  - Here we **ignore** government expenditure as a component of effective demand.
  - According to Keynes, the **level of employment** is determined by effective demand which, in turn, is determined by **aggregate demand function or aggregate demand price** and **aggregate supply function or aggregate supply price**.
  - In Keynes' words:
    - “The value of D (Aggregate Demand) at the point of Aggregate Demand function, where it is intersected by the Aggregate Supply function, will be called the effective demand.”

# i. Aggregate Supply (AS):

- Employers hire and purchase various inputs and raw materials to produce goods. Thus, production involves cost.
- If sales revenue from the sale of output produced exceed cost of production at a given level of employment and output, the entrepreneur would be induced to employ more labour and other inputs to produce more.
- At any given level of employment of labour, aggregate supply price is the total amount of money that all entrepreneurs in an economy expect to receive from the sale of output produced by given number of labourers employed. For each particular level of employment, there is an aggregate supply price.
- Here, by 'price' we mean the amount of money received from the sale of output, i.e., sales proceeds. Thus, aggregate supply prices refer to the proceeds from the sale of output at each level of employment and there are different aggregate supply prices for different levels of employment. If this information is expressed in a tabular form, we obtain "aggregate supply price schedule" or aggregate supply function.

# i. Aggregate Supply (AS):

- The **aggregate supply function** is a schedule of the minimum amounts of proceeds required to induce varying quantities of employment.
- According to Keynes, aggregate supply function is an increasing function of the level of employment.
- **Aggregate supply (AS) curve slopes upward from left to the right** because volume of **employment increases with the increase in sale proceeds**.
- But there is a **limit to increase output level**. This is called **full employment level of output beyond which output cannot be increased**. It is because of full employment that AS curve becomes vertical or perfectly inelastic.
- This means that the level of employment cannot exceed full employment ( $N_f$ ) even by increasing aggregate supply price. This is shown in Fig. 10.4.

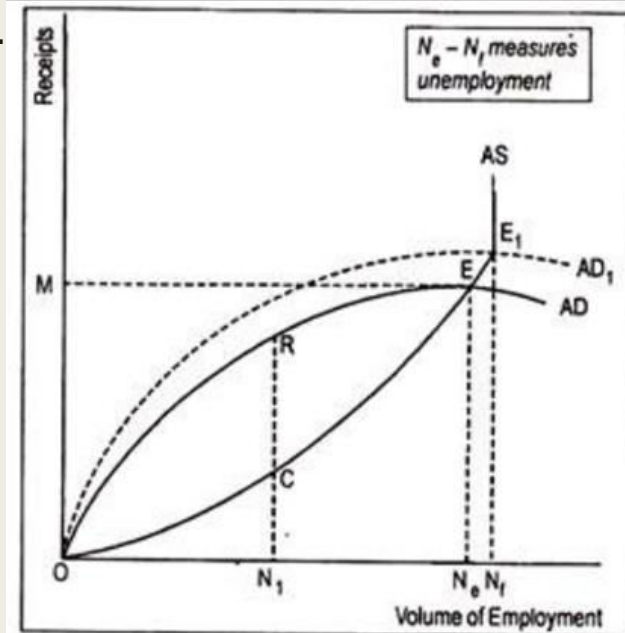
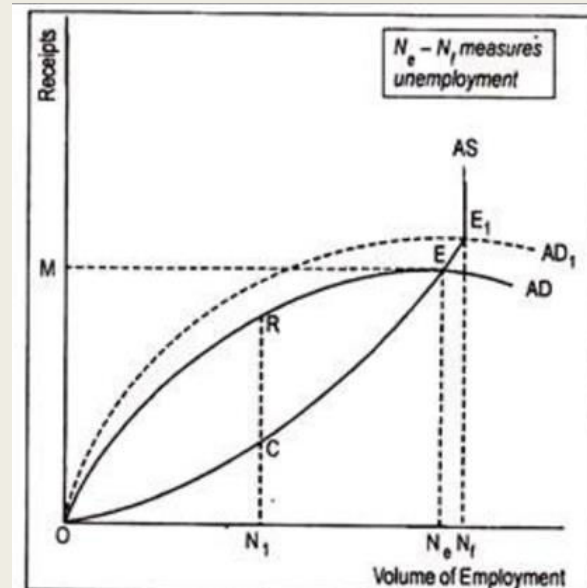


Fig. 10.4: Effective Demand and Determination of Employment

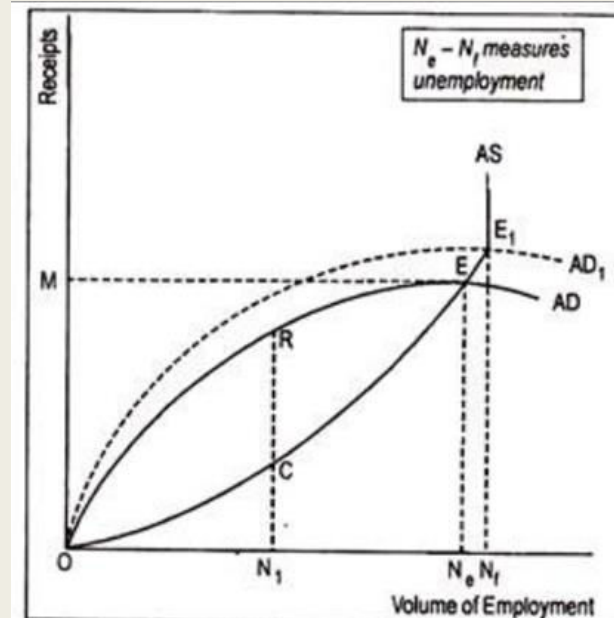
## ii. Aggregate Demand (AD):

- Aggregate demand or aggregate demand price is the **amount of money or price which all entrepreneurs expect to receive from the sale of output** produced by a given number of men employed. Or it refers to the **expected revenue** from the **sale of output** at a particular level of employment.
- Each **level of employment** is associated with a particular **aggregate supply price** and there are different **aggregate demand prices** for different levels of employment.
- Plotting the aggregate demand schedule we obtain aggregate demand curve as there is a **positive relation between the level of employment and aggregate demand price** i.e., expected sales receipts. This is shown in Fig. 10.4. It **rises from left to right**.



## (b) Equilibrium Level of Employment –the Point of Effective Demand:

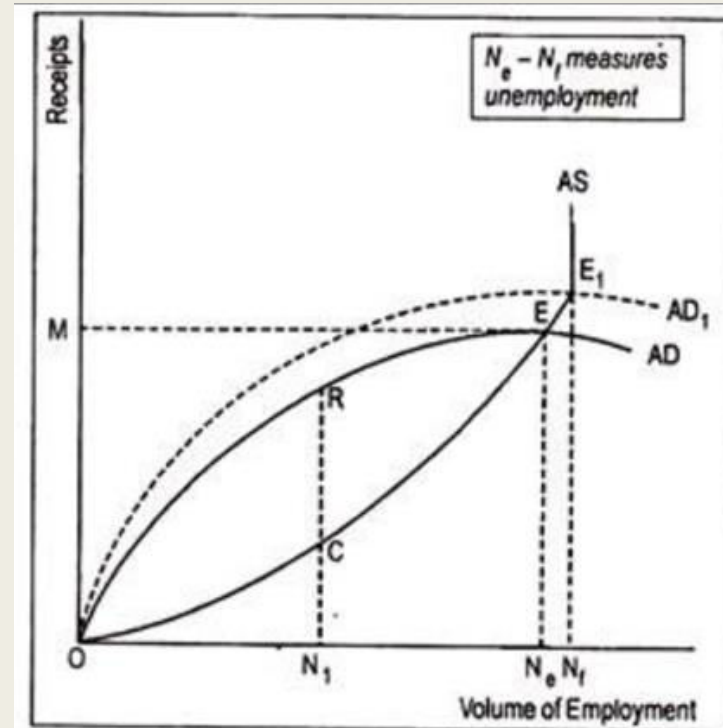
- The level of employment in an economy is determined at that point where the **aggregate supply price equals the aggregate demand price**.
- In other words, the **intersection of the aggregate supply function with the aggregate demand function** determines the **volume of income and employment** in an economy.
- It is thus clear that **as long as expected sales receipts of the entrepreneur** (i.e., aggregate demand schedule) **exceed costs** (i.e., aggregate supply schedule), **the level of employment should be increasing** and the process will continue until expected receipts equal costs or **aggregate demand curve intersects aggregate supply curve**.
- Note that the AS curve starts from the origin. If **aggregate receipts** (i.e., GNP) are zero, entrepreneurs **would not hire workers**. Likewise, **AD curve also starts from the origin**. The **equilibrium level of employment** is determined by the **intersection of the AS and AD curves**.





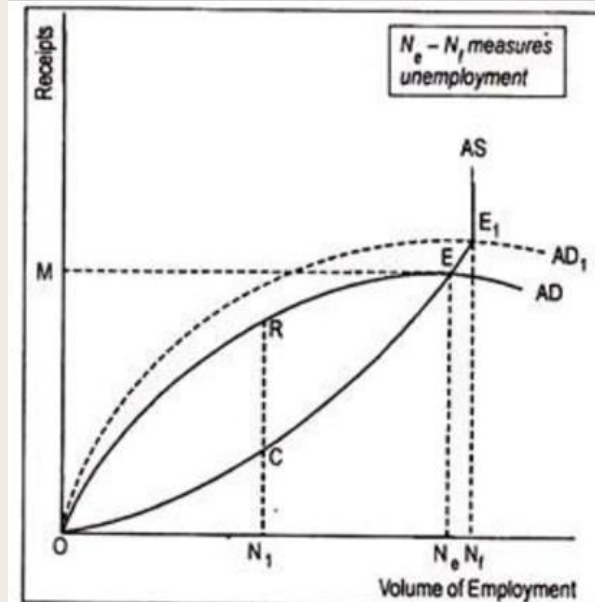
## (b) Equilibrium Level of Employment –the Point of Effective Demand:

- Keynesian system shows two kinds of equilibria—actual employment equilibrium determined by AD and AS curves and underemployment equilibrium.
- Keynes made little emphasis to the **aggregate supply function** since its determinants (such as technology, supply or availability of raw materials, etc.,) do not change in the short run.
- Indeed, for curing unemployment problem, he attached great importance to **demand-stimulating policies to cure unemployment**. In other words, Keynes paid emphasis on the **aggregate demand function**. That is why Keynes' theory is known as a **'theory of aggregate demand'**.



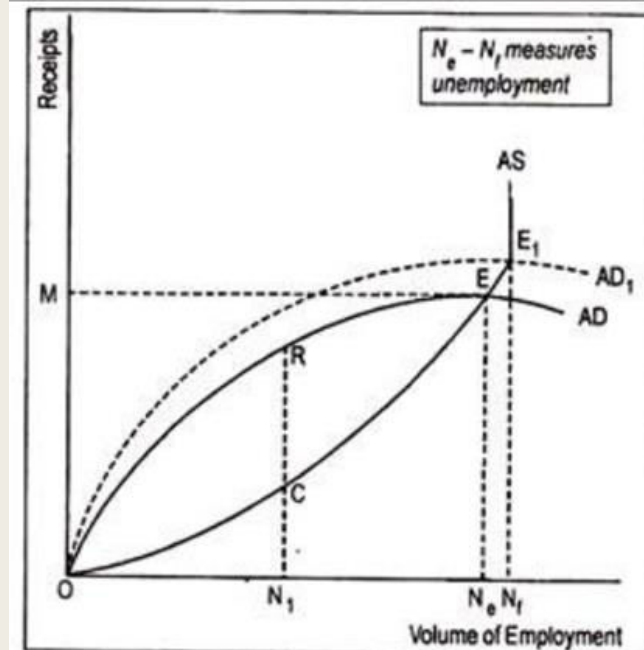
## (b) Equilibrium Level of Employment –the Point of Effective Demand:

- Fig. 10.4 shows the situation of equilibrium at less than full employment level.
- **Actual equilibrium,  $ON_e$** , is short of full employment equilibrium,  $ON_f$ . Thus, the distance  $ON_f - ON_e$  measures unemployment. This is called **involuntary unemployment**— a situation at which **people are willing to work but do not find jobs**. This unemployment, according to Keynes, is due to **deficiency of aggregate demand**.
- This unemployment can be removed by stimulating aggregate demand.
- **Aggregate demand** is the **sum total of consumption and investment demand or expenditures** in the economy.
- By raising consumption expenditure, level of employment can be raised. But there is a limit to consumption expenditure. So what is needed is the raising of (private) investment demand.



## (b) Equilibrium Level of Employment –the Point of Effective Demand:

- Anyway, **increase in consumption demand and investment demand** will **raise the level of employment** in the economy.
- The point of effective demand has been changed in Fig. 10.4 because of the shifting of AD curve from AD to AD<sub>1</sub>.
- New effective demand is now given by E<sub>1</sub>. Corresponding to this point, equilibrium level of employment is ON<sub>f</sub>—the level of full employment.
- Thus, in Keynes' theory, unemployment is due to the deficiency of effective demand. Only by stimulating effective demand can a higher level of employment be achieved. However, Keynes goes on arguing that equilibrium level of employment will not necessarily be at full employment.



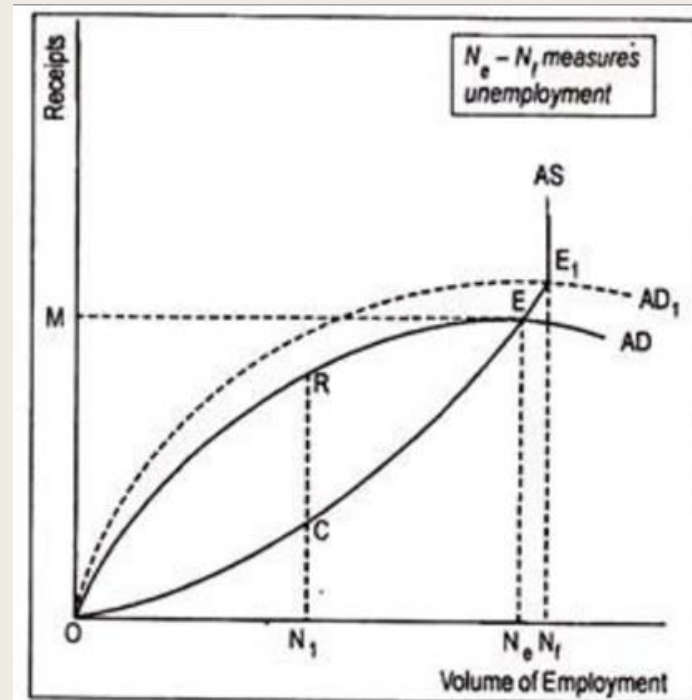
## (b) Equilibrium Level of Employment –the Point of Effective Demand:

- A capitalist economy will always experience underemployment equilibrium—an equilibrium situation less than full employment.
- Full employment, according to Keynes, can never be achieved. In Keynes' scheme of things, both consumption and investment cannot be raised enough to employ more work force.
- It is because of the multiplier effect of both private investment expenditure and government expenditure that there will be larger income, output and employment.
- But, equilibrium in the economy will be established at less than full employment situation because of:

(i) Wage rigidity

(ii) Interest inelasticity of investment

(iii) Liquidity trap.



Thank  
You!