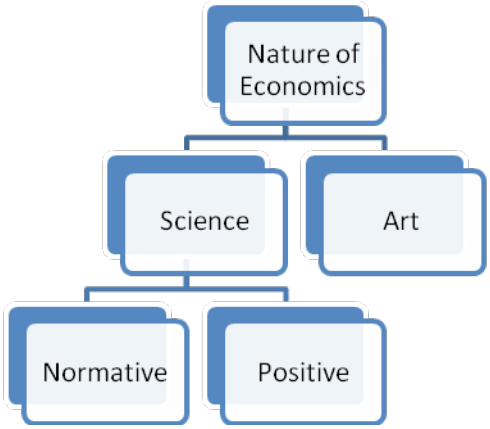
Unit 1
Introduction to Micro Economics

Definition of Economics

The term "Economics" was originally derived from the two Greek word "Oikos" which means household and "Nomon" which means management. Thus, it refers to managing of a household using the limited funds.

Many economists like Stigler, Samuelson, Macifie, Oscar Lange, Sciovosky, have given definition of economics –

1. "Economics is fundamentally a study of scarcity and the problems which scarcity gives rise to."
   -Stonier and Hagur
2. "Economic is a science concerned with the administration of scarce resources." **Scitovosky**



Economics as a Science

1) In simple words, a science is commonly defined as a systematic body of knowledge about a particular branch of the universe.
2) In the opinion of Poincare who says – "A science is built upon facts as a house is built of stones."
3) Applying this is to our subject, we find economics is built upon facts, examined and systematized by economists. Further, economics like other science deduce conclusion or generalizations after observing, collecting and examining facts. Thus, it deals with (i) observation of facts. (ii) Measurement (iii) Explanation (iv) Verification. In short, it formulates economic laws about human behaviour. In this way economics has developed into a science of making and possessing laws for itself.
4) Science economics satisfies all the tests of a science, economics is regarded as a full-fledged, science. In short, it is no way less than other sciences.

The economics as a science can be divided into two parts i.e. (a) Positive Science and (b) Normative Science.

I. **Economics as a Positive Science –** A positive science establishes a relation between cause and effect. It tells us that if we do a certain thing, same result will follow.

II. **Economics as A Normative Science –** Marshall, Pigou and historical school puts the arguments that economics is normative science i.e. it states: What should be done.

Therefore a positive science describes what is and a normative science describes what should be done & what should not be done.

From the above noted discussion, we can say that economics is both positive and normative science as at present, it deals with 'what is' and 'what ought to be'. Therefore, it not only focuses why certain things happen, it also conveys whether it is the right thing to happen.

Economics as an art

Art is completely different from science.

1) In the words of Cossa – "A science teaches us to know; an art teaches up to do. In other words, science explains and expounds; art directs, art imposes precepts or proposes rules."In other words, science is theoretical but an art is political.
2) What is an Art? As J.M. Keynes has put it: "An art is a system of rules for the attainment of a given end". The object of an art is the formulation of precepts applicable to policy. This implies that art is practical. Applying this definition of art, we can say economics is an art. Its several branches like I consumption, production and public finance provide practical guidance to solve economic problems. Again for example the theory of consumption guides the consumer to obtain maximum satisfaction with his given income (means). In this sense, economics can be considered as an art in the wider sense of the term art i.e. in the sense of practical science. It means creation or practical application of knowledge. It is for this reason; we treat economics as an art.

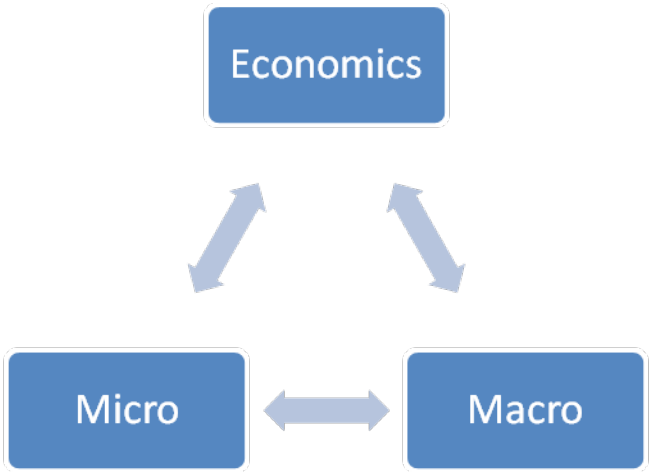
In a nutshell, we can conclude the discussion that economics is **both science and art.**

Practical uses of Economics

The main points of practical uses are discussed below –

1. Useful to the Consumer
2. Useful to the Producer
3. Helpful to Business Community
4. Solution to Economic Problems
5. Helpful to Workers
6. Helpful in Price Determination
7. Significant for Economics Development
8. Useful for Economic Planning
9. Useful for Social Workers
10. Helpful to Social Welfare Activities
11. Helpful in international Trade.

In short economics is useful for all.



Definitions of Micro Economics

Different economists have defined micro economics as under –

According to A.P. Lerner – "Micro economics consists of looking at the economy through a microscope, as it were, to see how the millions of cells in the body of the individuals, or households

as consumers, and the individuals or firms as producers-play their parts in the working of the whole economic organism."
According to K.E. Boulding – 'Micro economics is the study of particular firms, particular households, individual prices, wages, incomes, individual industries and particular commodities."
According to Shapiro – "Micro economics deals with small parts of the economy.

In every society, the economic problems faced by different economic agents (such as individual consumers, producers, etc.) can be analyzed with the help of microeconomic theories. This shows that
economics is a social science which aims at analyzing the economic behavior of individuals in a social environment.

Importance/Usefulness of Microeconomics
1. **Determination of demand pattern:** It determines the pattern of demand in the economy, *i.e.,* the amounts of the demand for the different goods and services in the economy, because the total demand for a good or service is the sum total of the demands of all the individuals. Thus, by determining the demand patterns of every individual or family, microeconomics determines the demand pattern in the country as a whole.
2. **Determination of the pattern of supply:** In a similar way, the pattern of supply in the country as a whole can be obtained from the amounts of goods and services produced by the firms in the economy. Microeconomics, therefore, determines the pattern of supply as well.
3. **Pricing:** Probably the most important economic question is the one of price determination. The prices of the various goods and services determine the pattern of resource allocation in the economy. The prices, in turn, are determined by the interaction of the forces of demand and supply of the goods and services. By determining demand and supply,
Microeconomics helps us in understanding the process of price determination and, hence, the process of determination of resource allocation in a society.
4. **Policies for improvement of resource allocation:** As is well-known, economic development stresses the need for improving the pattern of resource allocation in the country. Development polices, therefore, can be formulated only if we understand how the pattern of resource allocation is determined. For instance, if we want to analyze how a tax or a subsidy will affect the use of the scarce resources in the economy, we have to know how these will affect their prices. By explaining prices and, hence, the pattern of resource allocation, microeconomics helps us to formulate appropriate development policies for an underdeveloped economy.
5. **Solution to the problems of micro-units:** Since the study of microeconomics starts with the individual consumers and producers, policies for the correction of any wrong decisions at the micro-level are also facilitated by microeconomics. For example, if a firm has to know exactly what it should do in order to run efficiently, it has to know the optimal quantities of outputs produced and of inputs purchased. Only then can any deviation from these optimal levels be corrected. In this sense, microeconomics helps the formulation of policies at the micro-level.

Limitations of Microeconomics
However, microeconomics has its limitations as well:
1. **Monetary and fiscal policies:** Although total demand and total supply in the economy is the sum of individual demands and individual supplies respectively, the total economic picture of the country cannot always be understood in this simplistic way. There are many factors affecting the total economic system, which are outside the scope of Microeconomics. For example, the role of monetary and fiscal policies in the determination of the economic variables cannot be analyzed completely without going beyond microeconomics.
2. **Income determination:** Microeconomics also does not tell us anything about how the income of a country (*i.e.,* national income) is determined.

3. **Business cycles:** A related point is that, it does not analyze the causes of fluctuations in national income. The ups-and-downs of national income over time are known as business cycles. Microeconomics does not help us in understanding as to why these cycles occur and what the remedies are.

Unemployment: One of the main economic problems faced by an economy like India is the problem of unemployment. This, again, is one of the areas on which microeconomics does not shed much light. Because, if we are to find a solution to the unemployment problem, we must first understand the causes of this problem. For that, in turn, we must understand how the total employment level in the economy is determined. This is difficult to understand from within the confines of microeconomics.

Methods of Economic Analysis

An economic theory derives laws or generalizations through two methods:

(1) Deductive Method of Economic Analysis

The ***deductive method*** is also named as ***analytical***, ***abstract*** or ***prior*** method. The deductive method consists in deriving conclusions from general truths, takes few general principles and applies them draw conclusions. **(GENERAL TO PARTICULAR)**

For instance, if we accept the general proposition that man is entirely motivated by self-interest. Then Ram (a man) is also entirely motivated by self interest.

The classical and neo-classical school of economists notably, Ricardo, Senior, Cairnes, J.S. Mill, Malthus, Marshall, Pigou, applied the deductive method in their economic investigations.

Steps of Deductive Method:

The main steps involved in deductive logic are as under:

(i) Perception of the problem to be inquired into: In the process of deriving economic generalizations, the analyst must have a clear and precise idea of the problem to be inquired into.

(ii) Defining of terms: The next step in this direction is to define clearly the technical terms used analysis. Further, assumptions made for a theory should also be precise.

(iii) Deducing hypothesis from the assumptions: The third step in deriving generalizations is deducing hypothesis from the assumptions taken.

(iv) Testing of hypothesis: Before establishing laws or generalizations, hypothesis should be verified through direct observations of events in the rear world and through statistical methods. (Their inverse relationship between price and quantity demanded of a good is a well established generalization).

Merits of Deductive Method:

The main merits of deductive method are as under:

(i) This method is near to reality. It is less time consuming and less expensive.

(ii) The use of mathematical techniques in deducing theories of economics brings exactness and clarity in economic analysis.

(iii) There being limited scope of experimentation, the method helps in deriving economic theories.

(iv) The method is simple because it is analytical.

Demerits of Deductive Method:

It is true that deductive method is simple and precise, underlying assumptions are valid.

(i) The deductive method is simple and precise only if the underlying assumptions are valid. More often the assumptions turn out to be based on half truths or have no relation to reality. The conclusions drawn from such assumptions will, therefore, be misleading.

(ii) In deductive method, the premises from which inferences are drawn may not hold good at all times, and places. As such **deductive reasoning is not applicable universally**.

(iii) The deductive method is highly abstract. **It requires a great deal of care to avoid bad logic or faulty economic reasoning.**

(2) Inductive Method of Economic Analysis:

Inductive method which is also called ***empirical method*** was adopted by the "Historical School of Economists". It involves the process of reasoning from particular facts to general principle.

(PARTICULAR TO GENERAL)

This method derives economic generalizations on the basis of (i) Experimentations (ii) Observations and (iii) Statistical methods.

In this method, data is collected about a certain economic phenomenon. These are systematically arranged and the general conclusions are drawn from them.

For example, we observe 200 persons in the market. We find that nearly 195 persons buy from the cheapest shops, Out of the 5 which remains, 4 persons buy local products even at higher rate just to patronize their own products, while the fifth is a fool. From this observation, we can easily draw conclusions that people like to buy from a cheaper shop unless they are guided by patriotism or they are devoid of commonsense.

Steps of Inductive Method:

The main steps involved in the application of inductive method are:

(i) Observation.

(ii) Formation of hypothesis.

(iii) Generalization.

(iv) Verification.

Merits of Inductive Method:

(i) It is based on facts as such the method is realistic.

(ii) In order to test the economic principles, method makes statistical techniques. The inductive method is, therefore, more reliable.

(iii) Inductive method is dynamic. The changing economic phenomenon are analyzed and on the basis of collected data, conclusions and solutions are drawn from them.

(iv) Inductive method also helps in future investigations.

Demerits of Inductive Method:

The main weaknesses of this method are as under:

(i) If conclusions are drawn from insufficient data, the generalizations obtained may be faulty.

(ii) The collection of data itself is not an easy task. The sources and methods employed in the collection of data differ from investigator to investigator. The results, therefore, may differ even with the same problem.

(iii) The inductive method is time-consuming and expensive.

Conclusion:

The above analysis reveals that both the methods have weaknesses. We cannot rely exclusively on any one of them. Modern economists are of the view that both these methods are complimentary. They partners and not rivals. **Alfred Marshall** has rightly remarked:

"***Inductive and Deductive methods*** are both needed for scientific thought, as the right and left foot are both needed for walking". We can apply any of them or both as the situation demands.

What is Economic Equilibrium?

Economic equilibrium is a condition or state in which economic forces are balanced. In effect, economic variables remain unchanged from their equilibrium values in the absence of external influences. Economic equilibrium is also referred to as market equilibrium.

Economic equilibrium is the combination of economic variables (usually price and quantity) toward which normal economic processes, such as supply and demand, drive the economy. The term economic equilibrium can also be applied to any number of variables such as interest rates or aggregate consumption spending. The point of equilibrium represents a theoretical state of rest where all economic transactions that "should" occur, given the initial state of all relevant economic variables, have taken place.

KEY TAKEAWAYS

Economic equilibrium is a condition where market forces are balanced, a concept borrowed from physical sciences, where observable physical forces can balance each other.

The incentives faced by buyers and sellers in a market, communicated through current prices and quantities drive them to offer higher or lower prices and quantities that move the economy toward equilibrium.

Economic equilibrium is a theoretical construct only. The market never actually reach equilibrium, though it is constantly moving toward equilibrium.

Types of Economic Equilibrium

In microeconomics, economic equilibrium may also be defined as the price at which supply equals demand for a product, in other words where the hypothetical supply and demand curves intersect. If this refers to a market for a single good, service, or factor of production it can also be referred to as partial equilibrium, as opposed to general equilibrium, which refers to a state where all final good, service, and factor markets are in equilibrium themselves and with each other simultaneously. Equilibrium can also refer to a similar state in macroeconomics, where aggregate supply and aggregate demand are in balance.

Economic Equilibrium in the Real World

Equilibrium is a fundamentally theoretical construct that may never actually occur in an economy, because the conditions underlying supply and demand are often dynamic and uncertain. The state of all relevant economic variables changes constantly. Actually reaching economic equilibrium is something like a monkey hitting a dartboard by throwing a dart of random and unpredictably changing size and shape at a dartboard, with both the dartboard and the thrower careening around independently on a roller rink. The economy chases after equilibrium with out every actually reaching it.

With enough practice, the monkey can get pretty close though. Entrepreneurs compete throughout the economy, using their judgement to make educated guesses as to the best combinations of goods, prices, and quantities to buy and sell. Because a market economy rewards those who guess better, through the mechanism of profits, entrepreneurs are in effect rewarded for moving the economy toward equilibrium. The business and financial media, price circulars and advertising, consumer and market researchers, and the advancement of information technology all make information about the relevant economic conditions of supply and demand more available to entrepreneurs over time. This combination of market incentives that select for better guesses about economic conditions and the increasing availability of better economic information to educate those guesses accelerates the economy toward the "correct" equilibrium values of prices and quantities for all the various goods and services that are produced, bought, and sold.

Concept of Utility

Utility is a term in economics that refers to the total satisfaction received from consuming a good or service. Economic theories based on rational choice usually assume that consumers will strive to maximize their utility. The economic utility of a good or service is important to understand, because it directly influences the demand, and therefore price, of that good or service. In practice, a consumer's utility is impossible to measure and quantify. However, some economists believe that they can indirectly estimate what is the utility for an economic good or service by employing various models.

KEY TAKEAWAYS

- Utility, in economics, refers to the usefulness or enjoyment a consumer can get from a service or good.
- Economic utility can decline as the supply of a service or good increases.
- Marginal utility is the utility gained by consuming an additional unit of a service or good.

Ordinal Utility

Early economists of the Spanish Scholastic tradition of the 1300s and 1400s described the economic value of goods as deriving directly from this property of usefulness and based their theories of prices and monetary exchanges. This conception of utility was not quantified, but a qualitative property of an economic good. Later economists, particularly those of the Austrian School, developed this idea into an ordinal theory of utility, or the idea that individuals could order or rank the usefulness of various discrete units of economic goods.

Cardinal Utility

To Bernoulli and other economists, utility is modeled as a quantifiable or cardinal property of the economic goods that a person consumes. To help with this quantitative measurement of satisfaction, economists assume a unit known as a "util" to represent the amount of psychological satisfaction a specific good or service generates for a subset of people in various situations. The concept of a measurable util makes it possible to treat economic theory and relationships using mathematical symbols and calculations.

However, it separates the theory of economic utility from actual observation and experience, since "utils" cannot actually be observed, measured, or compared between different economic goods or between individuals.

If, for example, an individual judges that a piece of pizza will yield 10 utils and that a bowl of pasta will yield 12 utils, that individual will know that eating the pasta will be more satisfying. For the producers of pizza and pasta, knowing that the average bowl of pasta will yield two additional utils will help them price pasta slightly higher than pizza.

Additionally, utils can decrease as the number of products or services consumed increases. The first slice of pizza may yield 10 utils, but as more pizza is consumed, the utils may decrease as people become full. This process will help consumers understand how to maximize their utility by allocating their money between multiple types of goods and services as well as help companies understand how to structure tiered pricing.

The Definition of Total Utility
If utility in economics is cardinal and measurable, the total utility (TU) is defined as the sum of the satisfaction that a person can receive from the consumption of all units of a specific product or service. Using the example above, if a person can only consume three slices of pizza and the first slice of pizza consumed yields ten utils, the second slice of pizza consumed yields eight utils, and the third slice yields two utils, the total utility of pizza would be twenty utils.

The sum of the total satisfaction from the consumption of specific goods or services. It increases as more goods are consumed.
Total Utility (T.U.) = U1 + U2 + … + Un

The Definition of Marginal Utility
Marginal utility (MU) is defined as the additional (cardinal) utility gained from the consumption of one additional unit of a good or service or the additional (ordinal) use that a person has for an additional unit. Using the same example, if the economic utility of the first slice of pizza is ten utils and the utility of the second slice is eight utils, the MU of eating the second slice is eight utils. If the utility of a third slice is two utils, the MU of eating that third slice is two utils. In ordinal utility terms, a person might eat the first slice of pizza, share the second slice with their roommate, save the third slice for breakfast, and use the fourth slice as a doorstop.

Marginal
It is the additional satisfaction
Average Utility (A.U.) = T.U. / Number of units = T.U. / n
gained from each extra unit of consumption. It decreases with each additional increase in the consumption of a good.

Marginal Utility (M.U.) = Change in T.U. / Change in Total Quantity = Δ TU/ Δ Q

Average
One can obtain it by dividing the total unit of consumption by the number of total units. Suppose there are total n units, then

TU and MU

Ice-creams Consumed	Marginal Utility (MU)	Total Utility (TU)
1	20	20
2	16	36
3	10	46
4	4	50
5	0	50
6	-6	44

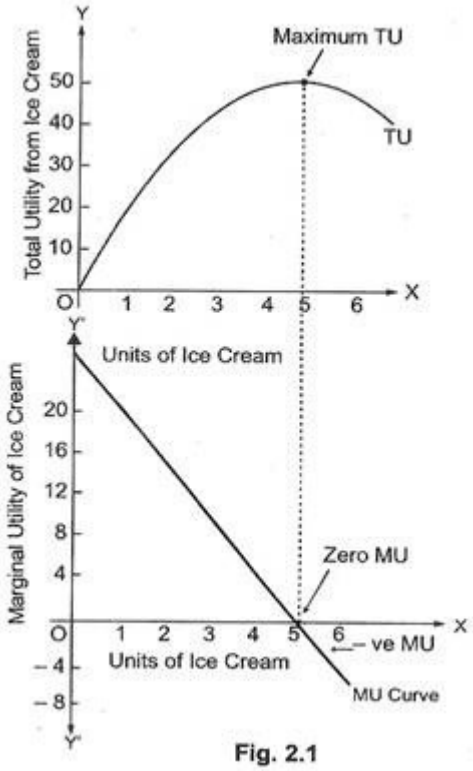


Fig. 2.1

In Fig.2. units of ice-cream, are shown along the X-axis and TU and MU are measured along the Y-axis. MU is positive and TU is increasing till the 4th ice-cream. After consuming the 5th ice-cream, MU is zero and TU is maximum.

This point is known as the point of satiety or the stage of maximum satisfaction. After consuming the 6th ice-cream, MU is negative (known as disutility) and total utility starts diminishing. Disutility is the opposite of utility. It refers to loss of satisfaction due to consumption of too much of a thing.

Types of Economic Utility
Form: It refers to the specific product or service that a company offers.
Place: It refers to the convenience and readiness of the services available at a place to the customer
Time: It refers to the ease of availability of products or services at the time when a customer needs.
Possession: It refers to the benefit a customer derives from the ownership of a company's product.

Opportunity cost
A benefit, profit, or value of something that must be given up to acquire or achieve something else. Since every resource (land, money, time, etc.) can be put to alternative uses, every action, choice, or decision has an associated opportunity cost.

Opportunity costs are fundamental costs in economics, and are used in computing cost benefit analysis of a project. Such costs, however, are not recorded in the account books but are recognized in decision making by computing the cash outlays and their resulting profit or loss

Opportunity costs represent the benefits an individual, investor or business misses out on when choosing one alternative over another. While financial reports do not show opportunity cost, business owners can use it to make educated decisions when they have multiple options before them.

Because by definition they are unseen, opportunity costs can be easily overlooked if one is not careful. Understanding the potential missed opportunities foregone by choosing one investment over another allows for better decision-making.

Opportunity Cost Formula and Calculation
Opportunity Cost=FO−CO
where:
FO=Return on best foregone option
CO=Return on chosen option

Opportunity Cost vs. Sunk Cost

The difference between an opportunity cost and a sunk cost is the difference between money already spent and potential returns not earned on an investment because the capital was invested elsewhere. Buying 1,000 shares of company A at $10 a share, for instance, represents a sunk cost of $10,000. This is the amount of money paid out to make an investment, and getting that money back requires liquidating stock at or above the purchase price.

From an accounting perspective, a sunk cost could also refer to the initial outlay to purchase an expensive piece of heavy equipment, which might be amortized over time, but which is sunk in the sense that you won't be getting it back. An opportunity cost would be to buy a piece of heavy equipment with an expected return on investment (ROI) of 5% or one with an ROI of 4%.

Again, an opportunity cost describes the returns that one could have earned if he or she invested the money in another instrument. Thus, while 1,000 shares in company A might eventually sell for $12 a share, netting a profit of $2,000, during the same period, company B increased in value from $10 a share to $15. In this scenario, investing $10,000 in company A netted a yield of $2,000, while the same amount invested in company B would have netted $5,000. The $3,000 difference is the opportunity cost of choosing company A over company B.

As an investor that has already sunk money into investments, you might find another investment that promises greater returns. The opportunity cost of holding the underperforming asset may rise to where the rational investment option is to sell and invest in the more promising investment.

Risk vs. Opportunity Cost

In economics, risk describes the possibility that an investment's actual and projected returns are different and that the investor loses some or all of the principal. Opportunity cost concerns the possibility that the returns of a chosen investment are lower than the returns of a forgone investment. The key difference is that risk compares the actual performance of an investment against the projected performance of the same investment, while opportunity cost compares the actual performance of an investment against the actual performance of different investment.

Still, one could consider opportunity costs when deciding between two risk profiles. If investment A is

risky but has an ROI of 25% while investment B is far less risky but only has an ROI of 5%, even though investment A may succeed, it may not. And if it fails, then the opportunity cost of going with option B will be salient.

Example of Opportunity Cost
When making big decisions like buying a home or starting a business, you will probably scrupulously research the pros and cons of your financial decision, but most day-to-day choices aren't made with a full understanding of the potential opportunity costs. If they're cautious about a purchase, many people just look at their savings account and check their balance before spending money. Often, people don't think about the things they must give up when they make those decisions.

The problem comes up when you never look at what else you could do with your money or buy things without considering the lost opportunities. Having takeout for lunch occasionally can be a wise decision, especially if it gets you out of the office for a much-needed break.

However, buying one cheeseburger every day for the next 25 years could lead to several missed opportunities. Aside from the missed opportunity for better health, spending that $4.50 on a burger could add up to just over $52,000 in that time frame, assuming a very achievable 5% rate of return.

This is a simple example, but the core message holds true for a variety of situations. It may sound like overkill to think about opportunity costs every time you want to buy a candy bar or go on vacation. Even clipping coupons versus going to the supermarket empty-handed is an example of an opportunity cost unless the time used to clip coupons is better spent working in a more profitable venture than the savings promised by the coupons. Opportunity costs are everywhere and occur with every decision made, big or small.

Questions Related to Discussion:
1. What do you understand by Economics?
2. Explain the types of Economics with examples.
3. Explain the limitations of Economics.
4. Explain the term utility.
5. What are the types of utility? Explain the relationship between marginal utility and total utility.
6. What do you understand by equilibrium?
7. Explain the law of diminishing marginal utility with the help of diagram.
8. Explain the term opportunity cost.

UNIT -2
Theory of Demand

MEANING OF DEMAND

Demand for a commodity is the amount of it that a consumer will purchase will be ready to take off from the market at various given prices in a period of time such as a day, week, month or a year. It constitute three things as (i) desire for a commodity (ii) ability to pay (availability of resources) (iii) willingness to spend the resources.

"The demand for anything at a given price is the amount of it which will be bought per unit of time at that price." According to Hansen, "By demand, we mean the quantity of a commodity that will be purchased at a particular price and not merely the desire of a thing." Thus demand in economics implies both the desire to purchase and the ability to pay for a good.

The demand for a commodity and quantity demanded are two different concepts. Demand refers to quantities of a commodity which consumers plan to buy at **various prices** of a good during a period of time whereas quantity demanded is the amount of good or service which consumers plan to buy at a **particular price.**

CLASSIFICATION OF DEMAND

The main classification types of demand are as under:

1. **Price Demand:** Price demand refers to the various quantities of commodity which the consumer will buy per unit of time at a certain prices (other things remaining the same). The quantity demanded changes with the change in price. The quantity demanded increases with a fall in price and the quantity demanded falls with an increase in price. In other words, we can say that quantity demanded and price have a negative correlation as

$D_A = f(P_A)$

Where D_A = Demand for commodity
A f = Function
P_A = Price of the commodity
A. P↑ D↓
P↓ D↑

2. **Income Demand:** Being **ceterus-paribus**, the income demand indicates the relationship between income and demand of the consumer. The income demand shows how much quantity a consumer will buy at different levels of his income. Generally, there is positive relationship between income and demand of the consumer i.e.

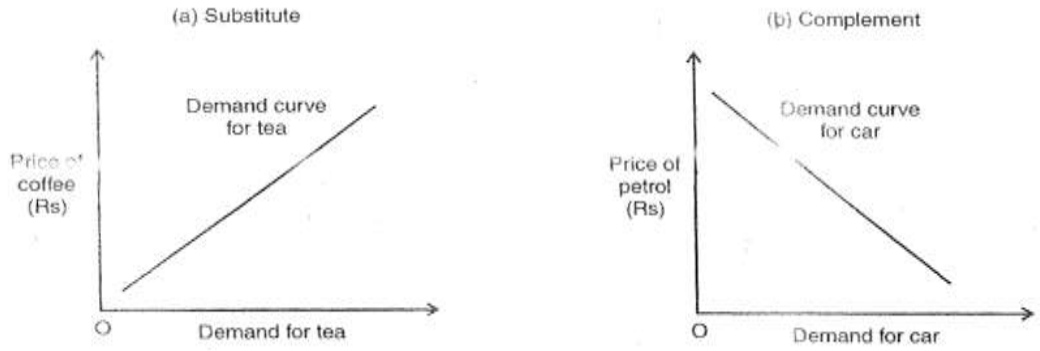
$D_A = f(Y_A)$

Where D_A = Demand for commodity
A Y_A = Income of the consumer
A. Y↑ D↑
Y↓ D↓

The above function shows as the income of the consumer increases demand also increases and when income falls demand also decreases.

3. **Cross Demand:** Cross demand refers to the relationship between quantity demanded of good 'A' and price to related good 'B' other things being equal. In simple words, from cross demand we mean the change in the quantity demanded of a commodity without any change in its price but due to the change in the price of related goods i.e. B commodity. The related

goods can either be substitute goods or complementary goods. The demand curve in the case of substitute will be of upward sloping while the demand curve in complementary goods will be of downward slope.



DEMAND SCHEDULE

It summarizes the information on prices and quantity demanded in a tabular form. It is of two types.

1. Individual Demand Schedule
2. Market Demand Schedule

1. **Individual Demand Schedule:** Considering other things being equal individual demand schedule refers to the quantities of the commodities demanded by the consumer at various prices. It can be explained with the help of table:

Individual Demand Schedule

Price per unit of the bale	Quantity Demanded
5	1
4	2
3	3
2	4
1	5

From the above table it is seen that as the price per unit say cotton goes on increasing, the quantity demanded goes on falling. As is clear, when price of cotton is Rs. 5, quantity demanded is 1 units. Now, the price of cotton falls to Rs. 3, the quantity demanded increases to 3 units. Moreover, as the price falls to Rs. 1 quantity demanded shoots upto 5 units.

Market Demand Schedule

The market demand is the summation of collective demand of all persons of a homogeneous commodity. Basically, the market demand schedule-depicts the functional relationship between prices and quantity demanded. If we are interested to know the demand schedule for a year, we will add the demand for all the months of that particular year. In this way, we may conclude that market demand schedule is a lateral summation of the quantities purchased by all individuals at different prices in a particular period of time. Therefore, "Market demand schedule is defined as the quantities of a given commodity which all consumers will buy at all possible prices at a given moment of time." The market demand schedule is shown in the following table.

Market Demand Schedule

Price Per Unit	Quantity Demanded by A	Quantity Demanded by B	Total Market Demand (A + B)
5	10	15	25
4	15	20	35
3	20	25	45
2	25	30	55
1	30	35	65

In table 2, market schedule is obtained by adding the demand of A and B at different prices. For instance, at a price of Rs. 5 the market demand is 25 i.e. 10 of A consumer and 15 for B consumer. AS the price falls to Rs. 1 the market demand increases to 65 i.e. 30 and 35 for A and B consumers respectively. In other words, we can say that like individual demand, market demand also depicts the negative correlation between price and quantity demanded.

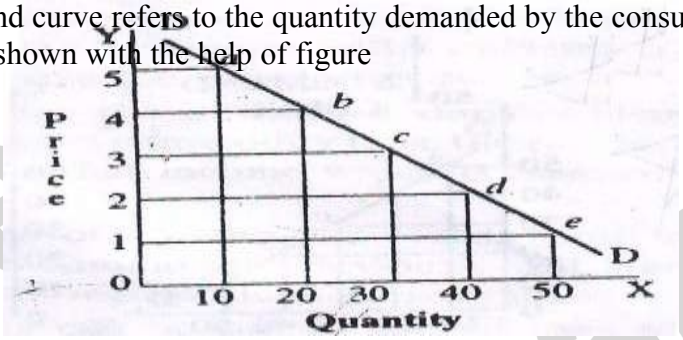
Demand Curve

It summarizes the information of prices and quantity demanded in graphical form. It is of two types:

1) Individual Demand Curve
2) Market Demand Curve

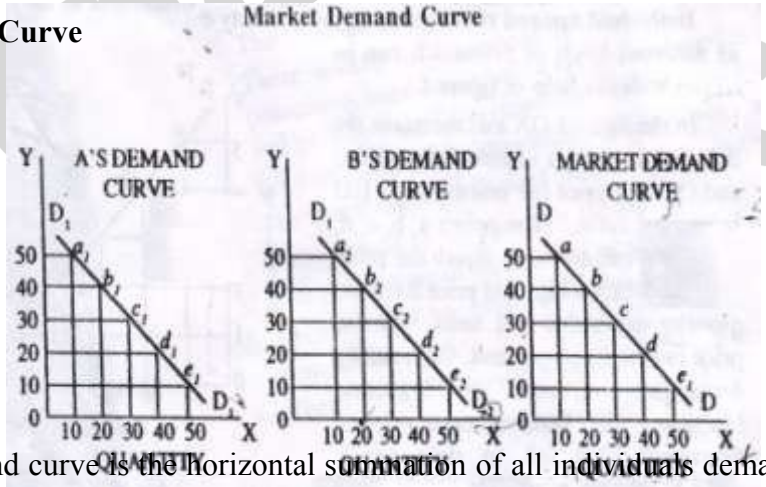
Individual Demand Curve

Individual demand curve refers to the quantity demanded by the consumer at different levels of prices. It can be shown with the help of figure



In the figure given above OX axis measures the different quantities of cotton demanded on OY-axis price per unit cotton. DD is demand curve. The points a, b, c, d, e on the demand curve shows the price quantity relationship. At price Rs. 5 the quantity demanded is 1 units. As the price falls to Rs. 1 per unit, the quantity demanded increases to 5 units. Moreover, the demand curve slopes downward from left to right which indicates that there is inverse relation between price and quantity demanded.

Market Demand Curve



The market demand curve is the horizontal summation of all individuals demand for the commodity. The above figures A and B shows the individual demand curves. D_1 D_1 and D_2 $D_2$are the demand

curves for consumers A and B and the market demand curve is DD. It is also assumed that there are two consumers in the market facing same price of the the commodity but they purchase according to their individual requirements.

A + B = Market Demand
At price Rs. 5 the market demand is
$a_1 + a_2 = a$
At price Rs. 4 the market demand is
$b_1 + b_2 = b$
In the same fashion, at prices 3, 2, 1, the market demand is
$c_1 + c_2 = c$
$d_1 + d_2 =$
d $e_1 + e_2$
= e
Now, if we combine these points we will get the market demand curve as DD.

Why Demand Curve Slopes Download to the Right
The Diagram for Demand Curve shows that demand curve slopes downward to the right. Why does it happen? The reasons behind the law of demand are following:
(i) Income effect. When price a commodity falls, real income of its consumers increases in terms of this commodity. In other words, their purchasing power increases since they are required to play less for the same quantity. According to another economic law, increase in real income (or purchasing power) increases demand for goods and services in general and for the goods with reduced price in particular. The increase in demand on account of increase in real income is called income effect.

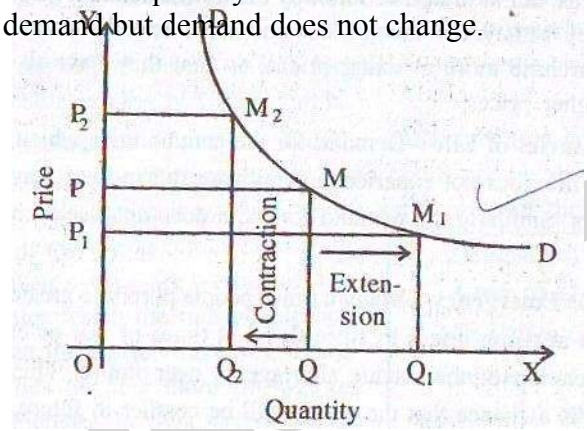
(ii) Substitution effect. When price of a commodity falls, it becomes cheaper compared to its substitutes, their prices remaining constant. In other words, when price of a commodity falls, price of its substitutes remaining the same, its substitute becomes relatively costlier. Consequently, rational consumers tend to substitute cheaper goods for costlier ones within the range of normal goods-goods whose demand increases with increase in consumer's income-other things remaining the same. Therefore, demand for the relatively cheaper commodity increases. The increase in demand on account of this factor is known as substitution effect.
(iii) Diminishing marginal utility. Marginal utility is the utility derived from the marginal unit a commodity when its price falls. When a person buys a commodity, he exchanges his money income with the commodity in order to maximize his satisfaction. He continues to buy goods and services so long as marginal utility of his money (Mu_ms) is less than the marginal utility of the commodity (Mu_c).commodity Mu_m with Mu_c, with a view to maximizing his satisfaction. Consequently, demand for a commodity increase when its price falls.

DETERMINANTS OF DEMAND
1. ***1)*** Price of the commodity
2. ***2)*** Price of substitutes and complementary goods.
3. ***3)*** Consumers' income.
4. ***4)*** Consumer's taste and preference**.**
5. ***5)*** Consumers' expectations of future prices
6. ***6)*** Demonstration effect/Advertisement
7. ***7)*** Consumer-credit facility
8. ***8)*** Population of the country
9. ***9)*** Distribution of national income
10. ***10)*** Season & weather

Changes in Demand

1) Movement along Demand Curve: When other things remaining the same, the quantity demanded of a commodity varies with variation in price only, these variations are known as Movement along Demand Curve. When the quantity demanded rises due to fall in the price of a commodity it is called **extension of demand**. On the contrary when the quantity demanded falls due to rise in price it is

known as **contraction of demand**. The quantity demanded varies with the change in price in case of extension and contraction of demand but demand does not change.



2) **Shift in Demand Curve:** When the demand for a commodity changes with changes in other elements and price remaining constant, it is known as shift in demand. When the demand for a commodity rises while price remaining constant or the quantity demanded remains unchanged even when the prices rises, it is called an **increase in demand**. Demand curve varies with an increase in demand and it shifts rightward from the initial demand curve. When the demand for a commodity falls while price remaining constant or the quantity demanded remains unchanged even when the prices falls, it is called an **decrease in demand**. Demand curve varies with a decrease in demand and it shifts leftward from the initial demand curve.

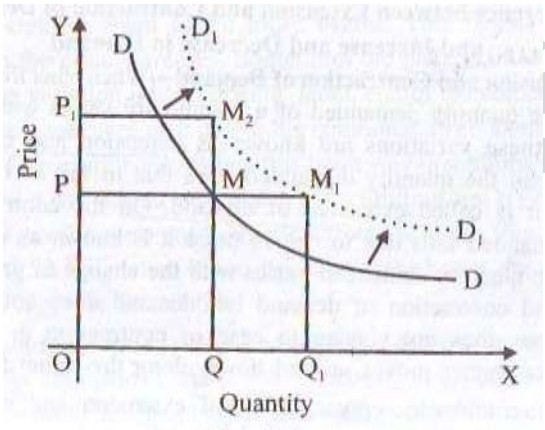


Fig. 5.5
Increase in demand

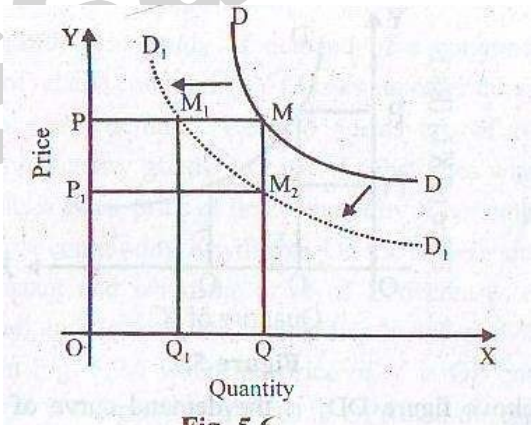


Fig. 5.6
Decrease in demand

Law of Demand

The law of demand states that there is inverse relation between the price and demand for a commodity. According to law of demand, **other things being equal**, if price of a commodity falls, the quantity demanded of it will rise and if price of a commodity rises, the quantity demanded of it will fall. Although, this relationship is not proportionate i.e. it does not mean when price falls by one-half the demand for good will be doubled. It simply shows the direction of change in demand as a result of change in price. We can say that quantity demanded and price have a inverse relationship.

Assumptions in the law of demand

According to Stigler and Boulding, the law of demand is based on the following assumptions:

1. There should be no change in the income of the consumers.
2. There should be no change in the tastes and preferences of the consumers, because the law of the demand applies only when the tastes and preferences of the consumers remain constant
3. Price of the related commodities should remain unchanged.
4. The commodity in questions should be a normal one.
5. There should be no change in the size of population.
6. There distribution of income and wealth should be equal.
7. There should be continuous demand except in case of indivisible commodities.
8. There should be perfect competition in the market.

Importance of the Law

The law of demand has been of great theoretical and practical importance in economics as:

1. Price Determination.
2. Importance for the consumer
3. Importance to Finance Minister
4. Important for Planning.
5. Important for Producers
6. Importance for Farmers

EXCEPTIONS TO THE LAW OF DEMAND

The law of demand is one of the fundamental laws of economics. The law of demand, however, does not apply to the following cases:

(i) Expectations regarding future prices.
(ii) Prestigious goods.
(iii) Giffen goods.

ELASTICITY OF DEMAND

Elasticity of demand is defined as the degree of responsiveness of the quantity demanded of a good to a change in its price, consumers income and prices of related goods. There are three concepts of demand elasticity – price elasticity, income elasticity and cross elasticity.

E = % change in Quantity demanded/% change in variable

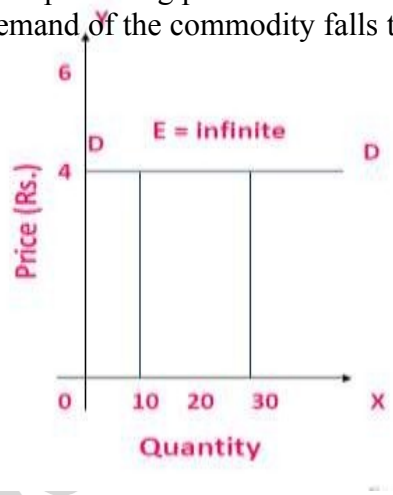
Price elasticity of demand

(**PED** or **E_d**) is a measure used in economics to show the responsiveness, or elasticity, of the quantity demanded of a good or service to a change in its price. More precisely, it gives the percentage change in quantity demanded in response to a one percent change in price (holding constant all the other determinants of demand, such as income).

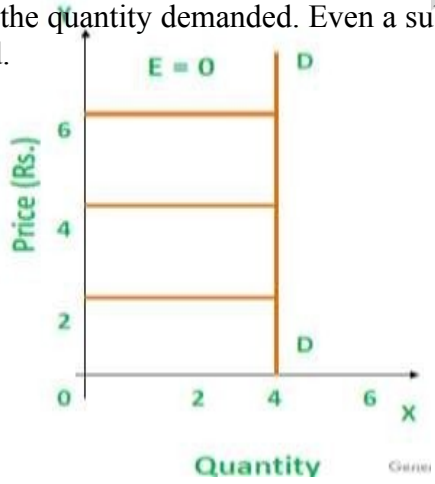
Price elasticity of Demand = Proportionate change in purchases of commodity X
Proportionate change in price of commodity X

Types/Degrees of Price Elasticity of Demand

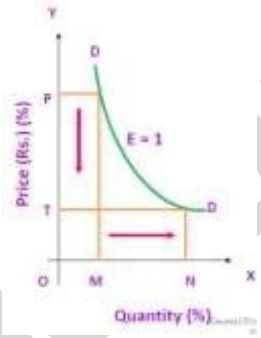
A) Perfectly Elastic Demand: A perfectly elastic demand refers to the situation when demand is infinite at the prevailing price. It is a situation where the slightest rise in price causes the quantity demand of the commodity falls to zero.



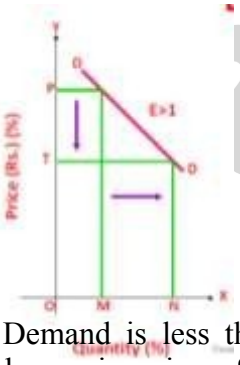
B) Perfectly Inelastic Demand: A perfectly inelastic demand refers to a situation when change in price causes no change in the quantity demanded. Even a substantial change in price does not impact quantity demanded.



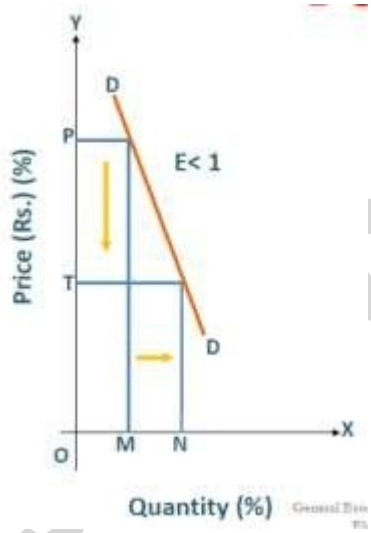
C) Unitary Elastic Demand: It is a situation when change in quantity demanded in response to change in own price of the commodity is such that total expenditure of the quantity remains constant. In short % change in quantity demanded is equal to % change in price.
This type of demand curve is called Rectangular Hyperbola



D) Greater than unitary Elastic Demand: Demand is greater than unitary elastic when change in quantity demanded in response to change in price of the commodity is such that total expenditure of the commodity increases when the price decreases, and total expenditure decreases when price increases. In short % change in quantity demanded is greater than % change in price.



E) Less than Unitary Elastic Demand: Demand is less than unitary elastic when change in quantity demanded in response to change in price of the commodity is such that total expenditure on the commodity decreases when price falls, and total expenditure increases when price rises. In short % change in quantity demanded is less than % change in price.



Methods to measure Price Elasticity of demand

There are three methods of measuring price elasticity of demand:

(1) Total Expenditure Method.

(2) Geometrical Method or Point Elasticity Method.

(3) Arc Method.

Total Expenditure (Outlay) Method:

This method is evolved by Dr. Alfred Marshall. According to this method, to measure the elasticity of demand it is essential to know how much & in what direction the total expenditure has changed as a result of change in the price of good

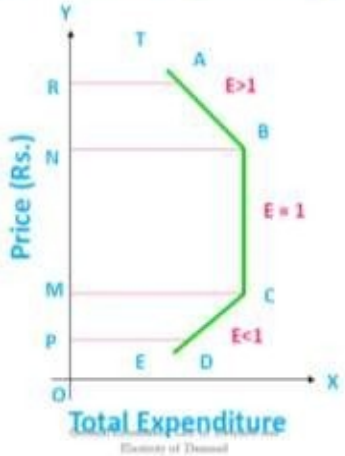
Total Expenditure (Outlay) Method

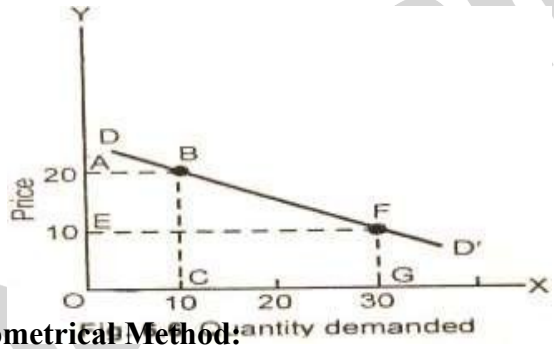
Elasticity of Demand	Price	Total Expenditure
Greater than Unity i.e. $E_p > 1$	↑ ↓	↓ ↑
Unity i.e. $E_p = 1$	Same Same	Unchanged Unchanged
Less than Unity i.e. $E_p < 1$	↑ ↓	↑ ↓

For Example:

Price Per Unit ($)	Quantity Demanded	Total Expenditure ($)
20	10 Pens	200.0
10	30 Pens	300.0

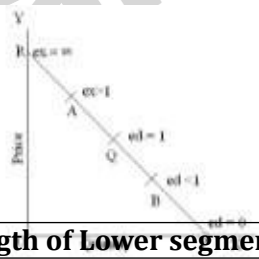
Total Expenditure (Outlay) Method





Point Method or Geometrical Method:

This method was also suggested by Alfred Marshall. It explains the elasticity of demand at a particular point of the demand curve if the demand function is linear one (or when demands curve is straight line sloping down from left to right). The point method is not applicable on curvilinear demand curves. This method is based on the proposition that each point of the straight line demand curve has different elasticity of demand. Different elasticity of demand. We have already shown (under the heading slope and elasticity) that every point on demand curve does not have the same elasticity. This has been explained by point method, also known as Geometrical Method. The basic formula for this method is :



Ep = Length of Lower segment/Length of Upper segment

Now we can calculate elasticity of demand at different points R,A,Q, B and P, As per the ratio of the lower part to upper part.

$$ep \text{ at } Q = \frac{QP}{RQ} = 1$$

$$ep \text{ at } A = \frac{AP}{AR} < 1$$

$$ep \text{ at } B = \frac{BP}{RB} > 1$$

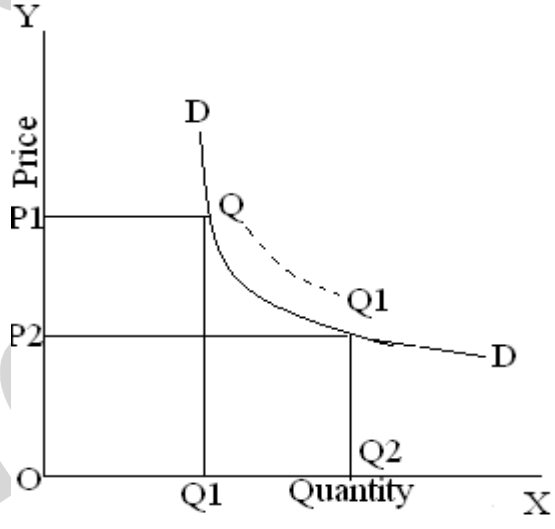
$$ep \text{ at } R = ep \frac{RP}{0} = \infty$$

$$\text{at } P = \frac{0}{RP} = 0$$

Therefore, we can say that at the mid-point on a straight line demand curve, elasticity will be unitary, at higher points (such as A and R) elasticity will be greater than one; at lower points (B and P) the elasticity will be less than one. At points R and P the elasticities will be infinite and zero respectively. Point method is very useful in economics. It helps us measuring elasticity with very small changes in price and quantity demanded. It also tells us that slope and elasticity are two different things.

Arc Method:

As we have seen that point elasticity method can be used to determine the elasticity of demand at different points when infinitesimal changes in price are taking place. If the price change is somewhat large or we have to measure elasticity between two different points rather than at a specific point we use Arc Method. When we have to measure the price elasticity over an arc of the demand curve, such as between points Q and Q1 on the demand curve in figure the point elasticity method cannot yield true picture. In measuring arc elasticity we use the average of the two prices and average of two quantities at these prices in the following manner.



Suppose commodity X's position is like this- At price of Rs. 10 (P1) its, quantity demanded is 100 (Q1) and at price of Rs. 5 (P2) its quantity demanded is 300 (Q2). The elasticity of demand as per Arc Method will be

$$ed = \frac{\Delta q}{\Delta p} \times \frac{p_1 + p_2}{q_1 + q_2}$$

$$= \frac{200}{} \times \frac{10 + 5}{}$$

$$= \frac{200}{5} \times \frac{15}{400} = 1.5$$

Income elasticity of demand

Income elasticity of demand measures the percentage change in demand caused by a percent change in income. A change in income causes the demand curve to shift reflecting the change in demand. IED is a measurement of how far the curve shifts horizontally along the X-axis. Income elasticity can be used to classify goods as normal or inferior. With a normal good demand varies in the same direction as income. With an inferior good demand and income move in opposite directions

Income Elasticity = Proportionate change in the quantity purchased /Proportionate change in Income

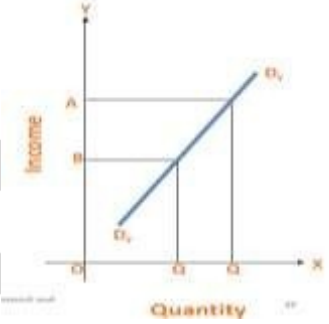
$$Ey = \frac{\text{\% Change in Quantity Demanded}}{\text{\% Change in Income}}$$

Degree of Income Elasticity of Demand

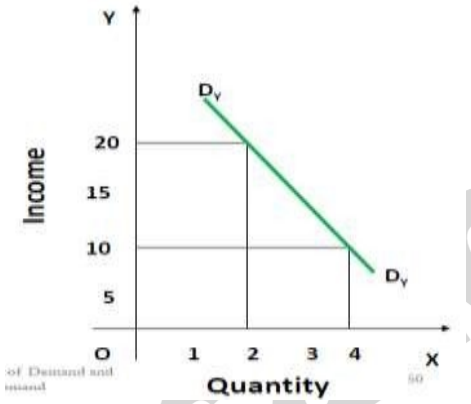
1. Positive Income Elasticity of Demand
   a. Unitary income elasticity of demand
   b. Less than unitary income elasticity of demand
   c. More than unitary income elasticity of demand
2. Negative income elasticity of demand
3. Zero income elasticity of demand

Positive income Elasticity of Demand

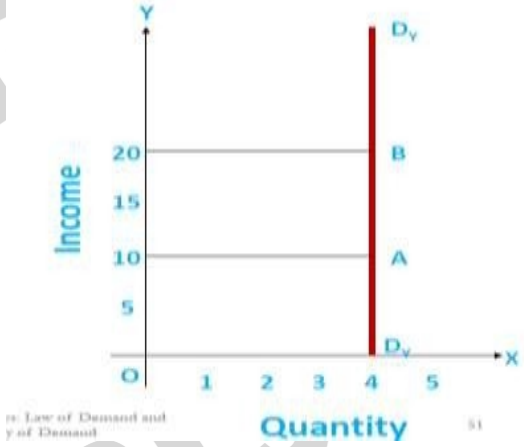
Income elasticity of demand for a good is positive, when with a increase in the income of a consumer his demand for the goods is increases and vice-versa.



Negative Income Elasticity of Demand:
Income Elasticity of Demand is negative when increases in the income of the consumer is accomplished by fall in demand of good.
It is negative in case of inferior goods which are known as Giften goods.



Zero Income Elasticity of Demand:
Income Elasticity of demand is zero, when change in the income of consumer evokes no change in his demands. Demands for necessaries like oil, salt, etc., have zero income elasticity of demand



CROSS ELASTICITY OF DEMAND

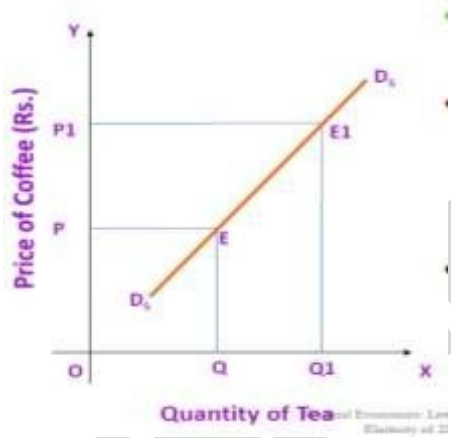
Cross price elasticity of demand measures the percentage change in demand for a particular good caused by a percent change in the price of another good. Goods can be complements, substitutes or unrelated. A change in the price of a related good causes the demand curve to shift reflecting a change in demand for the original good. Cross price elasticity is a measurement of how far, and in which direction, the curve shifts horizontally along the x-axis. Positive cross-price elasticity means that the goods are substitute goods.

Cross elasticity of Demand for X and Y = Proportionate change in purchases of commodity X
Proportionate change in price of commodity Y

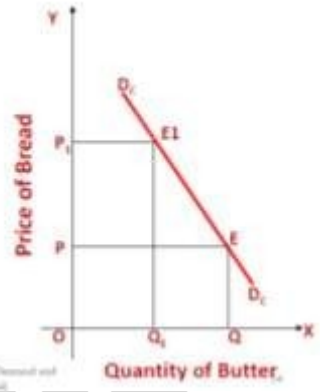
The numerical value of cross elasticity depends on whether the two goods in question are substitutes, complements or unrelated.

Degree of Cross Elasticity of Demand

Positive Cross Elasticity of Demand:
It is positive in case of substitute goods for example, Rise in the price of coffee will lead to increase in Demand for Tea. The curve slopes upward from left to right



Negative Cross Elasticity of Demand:
It is negative in case of complementry goods. For example rise in price of bread will bring down the demand for butter.the curves slopes downward from left to right.



Zero Elasticity Of Demand:
Cross elasticity of demand is zero when two goods are not related to each other . for example, Rise in the price of wheat will have no effect on the demand for shoes.

Types of Cross Elasticity

(i) Substitute Goods. When two goods are substitute of each other, such as coke and Pepsi, an increase in the price of one good will lead to an increase in demand for the other good. The numerical value of goods is positive.

For example there are two goods. Coke and Pepsi which are close substitutes. If there is increase in the price of Pepsi called good y by 10% and it increases the demand for Coke called good X by 5%, the cross elasticity of demand would be:

$E_{xy} = \%\Delta q_x / \%\Delta p_y = 0.2$

Since E_{xy} is positive ($E > 0$), therefore, Coke and Pepsi are close substitutes.

(ii) Complementary Goods. However, in case of complementary goods such as car and petrol, cricket bat and ball, a rise in the price of one good say cricket bat by 7% will bring a fall in the demand for the balls (say by 6%). The cross elasticity of demand which are complementary to each other is, therefore, 6% / 7% = 0.85 (**negative**).

(iv) **Unrelated Goods**. The two goods which a re unrelated to each other, say apples and pens, if the price of apple rises in the market, it is unlikely to result in a change in quantity demanded of pens. The elasticity is zero of unrelated goods.

Demand as Multivariate Function
Use of Functions and Variables in Economics

A function describes the relation between two or more than two variables.
That is, a function expresses dependence of one variable on one or more other variables.
Thus, if the value of a variable V depends on another variable X, we may write:
Y=f (X) …. (1)

Where f stands for function.

This expression (1) is read as 'Y is function of X'. This implies that every value of the variable Y is determined by a unique value of the variable X. In the function (1) Y is known as the dependent variable and X is the independent variable. Thus in function (1) Y is called the dependent variable and its value depends on the value of X Further, the independent variable is Interpreted as the cause and the dependent variable as the effect. An important function which is extensively used in economics is a demand function which expresses quantity demanded of a commodity is a function of its price, other factors being held constant.

Thus, demand for a commodity X is described as under:
Dx =f (Px)

Where Dx is the quantity demanded of commodity X and Px is its price.

Similarly, supply function of a commodity X is expressed as:

Sx = f (Px)
When the value of the variable Y depends on more than two variables X1, X2….. Xn this function is written in general form as:

Y = f (X1, X2, X3, X4……. Xn)

This shows the variable Y depends on several independent variables X1, X2……Xn where n is the number of independent variables. Again note that in economics we write 'causes' as the independent variables and 'effect' as the dependent variable.

For example, demand for a product is generally considered to be a function of its own price prices of other commodities (which may be substitutes or complements) income of the consumers, tastes and preferences of the consumers and advertising expenditure made by a firm to promote its product. Thus,

Dx = f (Px, PY, M, T, A)

Where

Dx = demand for the commodity X

Px = price of the commodity X

Py = price of a substitute product

M= income of the consumers

T = tastes and preferences of the consumer for the product.

A = advertising expenditure incurred by the firm.

The exact nature of relation of dependent variable with the independent variables can be known from the specific form of the function. The specific form of a unction can take a variety of mathematical forms. We explain below some specific types of functions.

Linear and Power Functions:

A widely used mathematical form of a function is a linear function.

A linear function can be stated in the following general form:

$Y = a + bX$

Where a and b are positive constants and are called parameters of the function. Note that parameters of a function are variables that are fixed and given in a specific function. The values of constants a and b determine the specific nature of a linear function.

The linear demand function with price as the only independent variable is written as:

$Qd = a – bP$

The minus sign before coefficient b indicates that quantity demanded of a commodity is negatively related with price of the commodity. That is, if price of a commodity falls, its quantity demand increases and vice versa.

If a equals 7 and b equals 0.5, the linear demand function can be expressed in the following specific form:
$Qd = 7 – 0.5\ P$

The above specific demand function shows that a unit fall in price of the commodity will cause 0.5 units increase in the quantity demanded of the commodity. If price (P) is zero, the second term (0.5P) in the demand function drops out and the quantity demanded is equal to 7.

We can take various values of P and find out different quantities (Qd) of a commodity demanded at them. In Figure 5.1 we have noted these price-quantity combinations on a graph and have obtained demand curve DD of the commodity representing the given demand function (Qd = 7- 0.5P).

It should be noted that, contrary to mathematical practice, by convention in economics to represent demand function we show the independent variable (price in the above case of demand function) on the y-axis and the dependent variable (the quantity demanded in the present case) on the x-axis. Graph of linear demand function is shown in Figure 5.1.

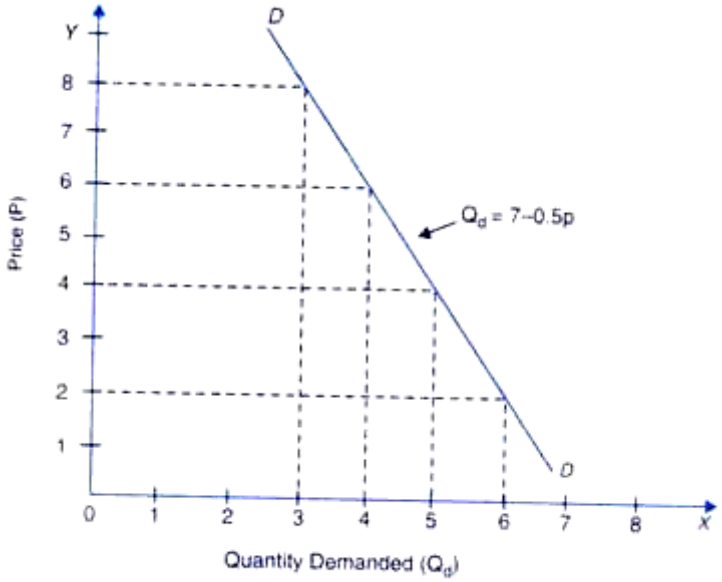


Fig. 5.1. *Graph of a Linear Demand Function ($Q_d = 7 - 0.5P$)*

It is worth noting that slope of the demand function curve in Figure 5.1 will represent ΔP/ ΔQ. However, if we represent quantity demanded (Qd) on the y-axis, and price (Px) on the x-axis; the slope of the demand curve so drawn would be equal to ΔQ/ΔP.

Multivariate Linear Demand Function:
Linear demand function with more than one independent variables, can be written in the following way:

Qx = a + b1 Px + b2 Py+ b3 M + b4 T + b5 A

Where b1, b2, b3, b4, are the coefficients of the respective variables. In economics the effect of variables other than the own price of a commodity in the demand function are depicted by shifts in the demand curve. For instance when income (M) of the consumers increases consumers will demand more of the product X at a given price. This implies shifting of the demand curve to the right.

The linear multivariate function is written in the following form:

Y = 4 – o.4X1 + 0.2X2+ 0.3X3 + 0.5 X4

In this function the coefficients 0.4, 0.2, 0.3 and 0.5 show the precise impact of the independent variables X1, X2, X3, X4 on the dependent variable Y.

Questions Related to above Discussion

1. What do you understand by demand?
2. Explain the types of demand with relevant examples.
3. Explain the government role in market demand.
4. Explain the effects of tax and subsidy on demand for various sectors.
5. Explain in detail the concept of elasticity of demand.
6. Explain the determinants of demand.
7. Explain demand as multivariate function.

UNIT-3
Theory of Consumer Behavior

The concept of indifference curve analysis was first propounded by British economist Francis Ysidro Edgeworth and was put into use by Italian economist Vilfredo Pareto during the early 20th century. However, it was brought into extensive use by economists J.R. Hicks and R.G.D Allen.

Hicks and Allen criticized Marshallian cardinal approach of utility and developed indifference curve theory of consumer's demand. Thus, this theory is also known as ordinal approach.

Indifference curve
An indifference curve is a locus of all combinations of two goods which yield the same level of satisfaction (utility) to the consumers.

Since any combination of the two goods on an indifference curve gives equal level of satisfaction, the consumer is indifferent to any combination he consumes. Thus, an indifference curve is also known as 'equal satisfaction curve' or 'iso-utility curve'.

On a graph, an indifference curve is a link between the combinations of quantities which the consumer regards to yield equal utility. Simply, an indifference curve is a graphical representation of indifference schedule.

The table given below is an example of indifference schedule and the graph that follows is the illustration of that schedule.

Table: Indifference schedule

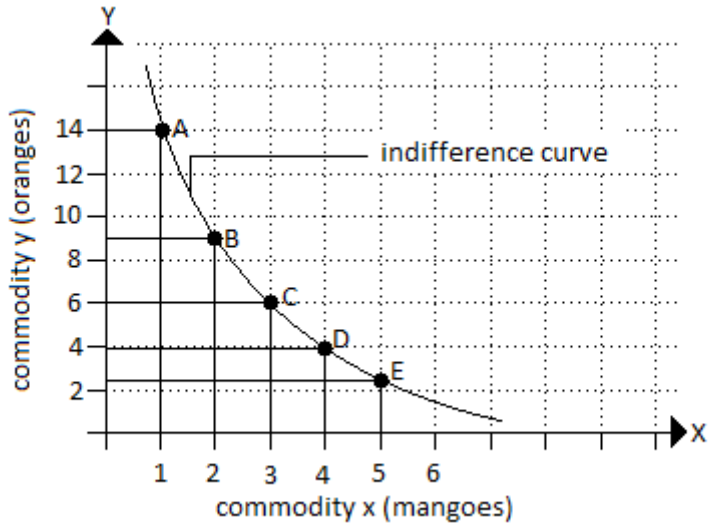
Combination	Mangoes	Oranges
A	**1**	**14**
B	**2**	**9**
C	**3**	**6**
D	**4**	**4**
E	**5**	**2.5**

Table: Indifference schedule

Combination	Mangoes	Oranges
A	1	14
B	2	9
C	3	6
D	4	4

E	5	2.5

Figure: Graphical representation of indifference curve



Assumptions of indifference curve

The indifference curve theory is based on few assumptions. These assumptions are

Two commodities

It is assumed that the consumer has fixed amount of money, all of which is to be spent only on two goods. It is also assumed that prices of both the commodities are constant.

Non satiety

Satiety means saturation. And, indifference curve theory assumes that the consumer has not reached the point of satiety. It implies that the consumer still has the willingness to consume more of both the goods. The consumer always tends to move to a higher indifference curve seeking for higher satisfaction.

Ordinal utility

According to this theory, utility is a psychological phenomenon and thus it is unquantifiable. However, the theory assumes that a consumer can express utility in terms of rank. Consumer can rank his/her preferences on the basis of satisfaction yielded from each combination of goods.

Diminishing marginal rate of substitution

Marginal rate of substitution may be defined as the amount of a commodity that a consumer is willing to trade off for another commodity, as long as the second commodity provides same level of utility as the first one.

And, diminishing marginal rate of substitution states that the rate by which a person substitutes X for Y diminishes more and more with each successive substitution of X for Y.

As indifference curve theory is based on the concept of diminishing marginal rate of substitution, an indifference curve is convex to the origin.

Rational consumers

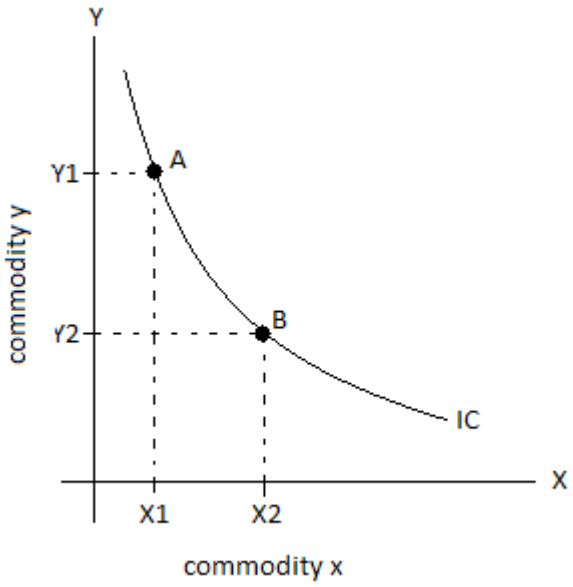
According to this theory, a consumer always behaves in a rational manner, i.e. a consumer always aims to maximize his total satisfaction or total utility.

Properties of indifference curve

There are four basic properties of an indifference curve. These properties are
Indifference curve slope downwards to right

An indifference curve can neither be horizontal line nor an upward sloping curve. This is an important feature of an indifference curve.

When a consumer wants to have more of a commodity, he/she will have to give up some of the other commodity, given that the consumer remains on the same level of utility at constant income. As a result, the indifference curve slopes downward from left to right.



In the above diagram, IC is an indifference curve, and A and B are two points which represent combination of goods yielding same level of satisfaction.
We can see that when X1 amount of commodity X was consumed, Y1 amount of commodity Y was also consumed. When the consumer increased the consumption of commodity X to X2, the amount of commodity Y fell to Y2. And, thus the curve is sloping downward from left to right.

Indifference curve is convex to the origin

As mentioned previously, the concept of indifference curve is based on the properties of diminishing marginal rate of substitution.

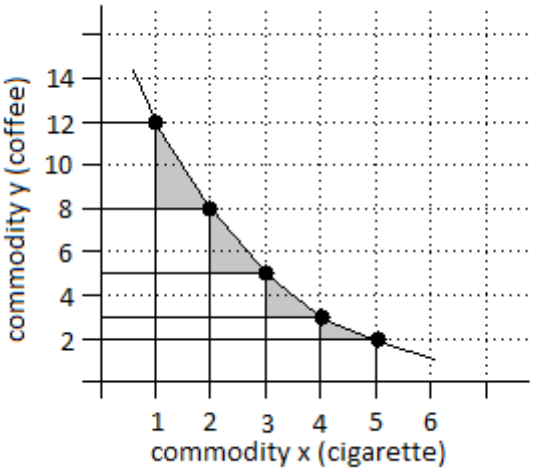
According to diminishing marginal rate of substitution, the rate of substitution of commodity X for Y decreases more and more with each successive substitution of X for Y.

Also, two goods can never perfectly substitute each other. Therefore, the rate of decrease in a commodity cannot be equal to the rate of increase in another commodity.

Table: Indifference schedule

Combination	Cigarette	Coffee
A	1	12
B	2	8
C	3	5
D	4	3
E	5	2

The above table represents various combination of coffee and cigarette that gives a man same level of utility. When the man drinks 12 cup of coffee, he consumes 1 cigarette every day. When he started consuming two cigarettes a day, his coffee consumption dropped to 8 cups a day. In the same way, we can see other combinations as 3 cigarettes + 5 cup coffee, 4 cigarettes + 3 cup coffee and 5 cigarettes + 2 cup coffee.



We can clearly see that the rate of decrease in consumption of coffee is not the same as rate of increase in consumption of cigarette. Similarly, rate of decrease in consumption of coffee has gradually decreased even with constant increase in consumption of cigarette.

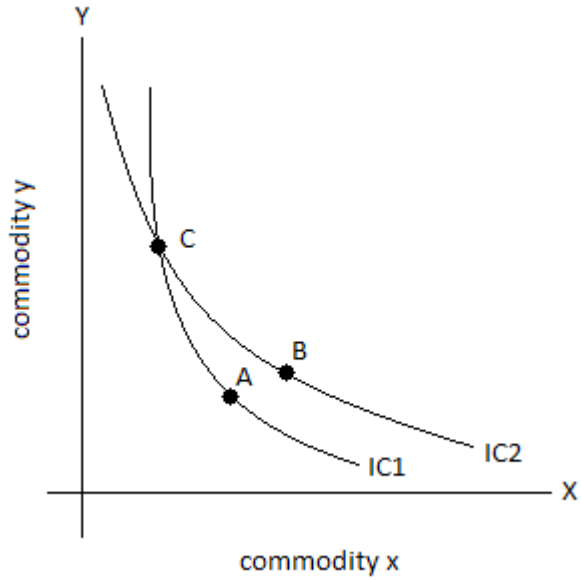
Thus, indifference curve is always convex (neither concave nor straight).

Indifference curve cannot intersect each other

Each indifference curve is a representation of particular level of satisfaction.

The level of satisfaction of consumer for any given combination of two commodities is same for a consumer throughout the curve. Thus, indifference curves cannot intersect each other.

The following diagram will help you understand this property clearer.



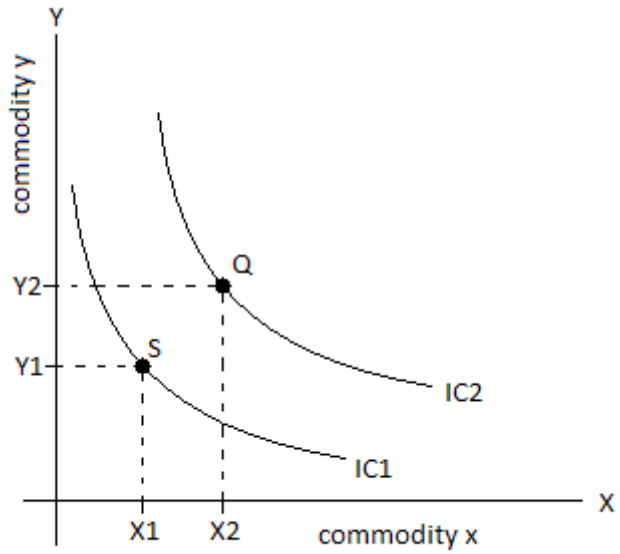
In the above image, IC1 and IC2 are two indifference curves and C is the point where both the curves intersect.

According to indifference curve theory, satisfaction at point C = satisfaction at point A
Also, satisfaction at point C = satisfaction at point B
But, satisfaction at point B ≠ satisfaction at point A.

Therefore, two indifference curves cannot intersect. Yet, two indifference curves need not be parallel to each other.

Higher indifference curve represents higher level of satisfaction

Higher the indifference curves, higher will be the level of satisfaction. This means, any combination of two goods on the higher curve give higher level of satisfaction to the consumer than the combination of goods on the lower curve.



In the above figure, IC1 and IC2 are two indifference curves, and IC2 is higher than IC1. We can also see that Q is a point on IC2 and S is a point on IC2.

Combination at point Q contains more of both the goods (X and Y) than that of the combination at point S. We know that total utility of commodity tends to increase with increase in stock of the commodity. Thus, utility at point Q is greater than utility at point S, i.e. satisfaction yielded from higher curve is greater than satisfaction yielded from lower curve.

Indifference Map

An Indifference Map is a set of Indifference Curves. It depicts the complete picture of a consumer's preferences. The following diagram showing an indifference map consisting of three curves:

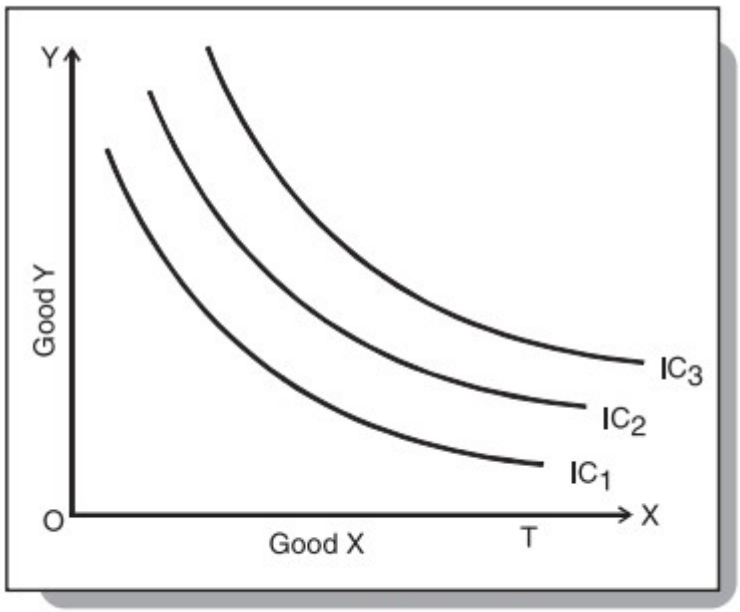


Fig. 2 : Indifference Map

We know that a consumer is indifferent among the combinations lying on the same indifference curve. However, it is important to note that he prefers the combinations on the higher indifference curves to those on the lower ones.

This is because a higher indifference curve implies a higher level of satisfaction. Therefore, all combinations on IC1 offer the same satisfaction, but all combinations on IC2 give greater satisfaction than those on IC1.

Marginal Rate of Substitution

This is the rate at which a consumer is prepared to exchange a good X for Y. If we go back to Peter's example above, we have the following table:

Combination	Food	Clothing	MRS
A	1	12	–
B	2	6	6
C	3	4	2

D	4	3	1

In this example, Peter initially gives up 6 units of clothing to get an extra unit of food. Hence, the MRS is 6. Similarly, for subsequent exchanges, the MRS is 2 and 1 respectively. Therefore, MRS of X for Y is the amount of Y whose loss can be compensated by a unit gain of X, keeping the satisfaction the same.

Interestingly, as Peter accumulates more units of food, the MRS starts falling – meaning he is prepared to give up fewer units of clothing for food. There are two reasons for this:

1. As Peter gets more units of food, his intensity of desire for additional units of food decreases.
2. Most of the goods are imperfect substitutes for one another. If they could substitute one another perfectly, then MRS would remain constant.

Budget Line

Since a higher indifference curve represents a higher level of satisfaction, a consumer will try to reach the highest possible IC to maximize his satisfaction. In order to do so, he has to buy more goods and has to work under the following two constraints:

1. He has to pay the price for the goods and
2. He income is limited, restricting the availability of money for purchasing these goods

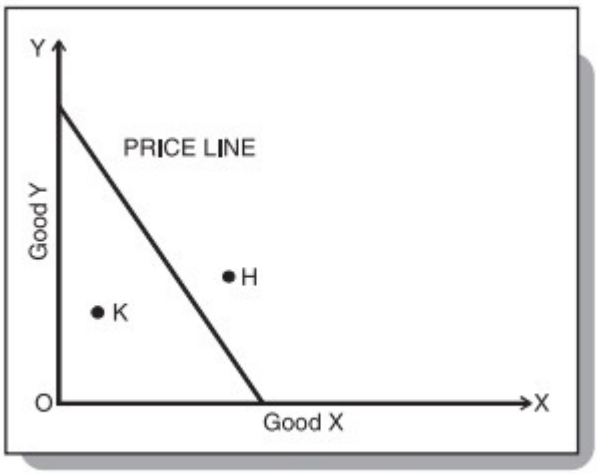


Fig. 4 : Price Line

As can be seen above, a budget line shows all possible combinations of two goods that a consumer can buy within the funds available to him at the given prices of the goods. All combinations that are within his reach lie on the budget line.

A point outside the line (point H) represents a combination beyond the financial reach of the consumer. On the other hand, a point inside the line (point K) represents under-spending by the consumer.

The Uses or Application of Indifference Curve Analysis!

The indifference curve technique has come as a handy tool in economic analysis. It has freed the theory of consumption from the unrealistic assumptions of the Marshallian utility analysis. In particular, mention may be made of consumer's equilibrium, derivation of the demand curve and the concept of consumer's surplus.

The indifference curve analysis has also been used to explain producer's equilibrium, the problems of exchange, rationing, taxation, supply of labour, welfare economics and a host of other problems. Some of the important problems are explained below with the help of this technique.

(1) The Problem of Exchange:

With the help of indifference curve technique the problem of exchange between two individuals can be discussed. We take two consumers A and B who possess two goods X and Y in fixed quantities respectively. The problem is how can they exchange the goods possessed by each other. This can be solved by constructing an Edgeworth-Bowley box diagram on the basis of their preference maps and the given supplies of goods.

In the box diagram, Figure 12.28, O_a is the origin for consumer A and O_b the origin for consumer B (turn the diagram upside down for understanding). The vertical sides of the two axes, O_a and O_b, represent good Y and the horizontal sides, good X. The preference map of A is represented by the indifference curves I_1a, I_2 a and I_3 a and B's map by I_1b, I_2b and I_3b indifference curves. Suppose that in the beginning A possesses O_bY_b units of good Y and O_b X_b units of good X. B is thus left with O_bY_b of Y and O_b X_b of X. This position is represented by point E where the curve I_1a intersects I_1b.

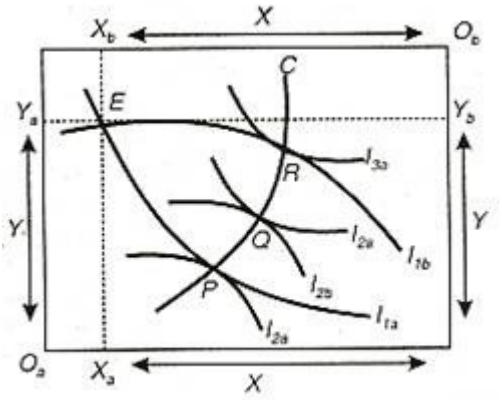


Fig. 12.28

Suppose A would like to have more of X and S more of Y. Both will be better off, if they exchange each other's unwanted quantity of the good, i.e. if each is in a position to move to a higher indifference curve. But at what level will exchange take place? Both will exchange each other's good at a point where the marginal rate of substitution between the two goods equals their price ratios.

This condition of exchange will be satisfied at a point where the indifference curves of both the exchangers touch each other. In the above figure P, Q and R are the three conceivable points of exchange. A line CC passing through these points is the "contract curve" or the "conflict curve", which shows the various positions of exchange of X and Y that equalise the marginal rates of substitution of the two exchangers.

If exchange were to take place at point P then consumer S would be in an advantageous position because he is on the highest indifference curve I_3b. Individual A would, however, be at a disadvantage for he is on the lowest indifference curve I_1a. On the other side, at point R, consumer A would be the maximum gainer and S the loser. However, both will be at an equal position of advantage at Q. They can reach this level only by mutual agreement otherwise the point of exchange depends upon the bargaining power of each party. If A has better bargaining skill than S, he can push the latter to point R. Contrariwise, if B is more skillful in bargaining he can push A to point P.

(2) Effects of Subsidy on Consumers:

The indifference curve technique can be used to measure the effects of government subsidy on low income groups. We take a situation when the subsidy is not paid in money but the consumers are supplied cereals at concessional rates, the price-difference being paid by the government. This is actually being

done by the various state governments in India. In Figure 12.29 income is measured on the vertical axis and cereals on the horizontal axis.

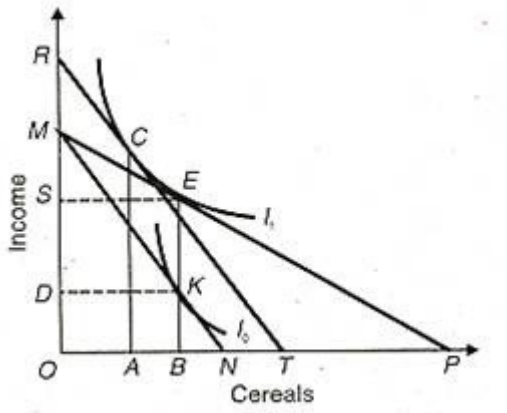


Fig. 12.29

Suppose the consumer's income is OM and his price-income line without subsidy is MN. When he is given subsidy by supplying cereals at a lower price, his price-income line is MP (it is equivalent to a fall in the price of cereals). At this price-income line, he is in equilibrium at point E on curve I_1 where he buys OB of cereals by spending MS amount of money. The full market price of OB cereals is MD on the line MN where the curve l_o touches.

The government, therefore, pays SD amount of subsidy. But the consumer receives cereals at a lower price. He does not receive SD amount of subsidy in cash. If the money value of the subsidy were to be paid to him in cash, they would receive MR amount of money. The equivalent variation MR shows that in the absence of the subsidy, a cash payment would bring the consumer on the same indifference curve, which makes him as better off as the subsidy.

But the value of the subsidy MR to the consumer is smaller than the cost of the subsidy DS to the government. It reveals the fact that the consumer is happier if he is paid the subsidy in cash rather than in the E S form of subsidised cereals. In this case, the cost of subsidy to the exchequer will also be less. It points out to another interesting result. When the income of the consumer is raised by giving him cash subsidy, he will buy less cereals than before. In Figure 12.29 at the equilibrium point C, he buys OA of cereals which are less than OB when he was getting them at the subsidised price. This is what the government actually wants.

(3) The Problem of Rationing:

The indifference curve technique is used to explain the problem arising from various systems of rationing. Usually rationing consists of giving specific and equal quantities of goods to each individual (we ignore families because equal quantities are not possible in their case).

The other, rather liberal, scheme is to allow an individual more or less quantities of the rationed goods according to his taste. It can be shown with the help of indifference curve analysis that the latter scheme is definitely better and beneficial than the former.

Let us suppose that there are two goods rice and wheat that are rationed, the prices of the two goods are equal and that each consumer has the same money income. Thus, given the income and price-ratios of the two goods, MN is the price-income line. Rice is taken on vertical axis and wheat on the horizontal axis in Figure 12.30.

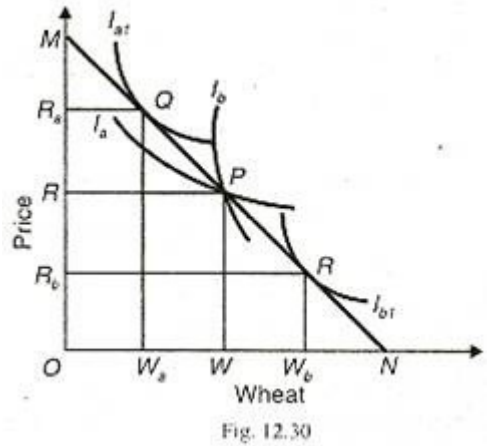


Fig. 12.30

According to the first system of rationing, both consumers A and B are given equal specific quantities of rice and wheat, OR + OW. Consumer A is on indifference curve I_a and B is on l_b. With the introduction of the liberal scheme each can have more or less of rice or wheat according to his taste. In this situation, A will move from P to Q on a higher indifference curve I_{a1}. Now he can have OR_b of rice + OW_a of wheat. Similarly, B will move from P to R on a higher indifference curve I_{b1} and can buy OR_b of rice + OW_b of wheat. With the introduction of the liberal scheme of rationing both the consumers derive greater satisfaction. The total quantity of goods sold is the same.

For when B buys more quantity of wheat WW_b, he purchases less quantity of rice RR_b and when A buys RR_b more of rice, he purchases WW less of wheat. Thus, the governmental aim of controlled distribution of goods is not disturbed at all rather there has been a better distribution of goods in accordance with individual tastes.

(4) Index Numbers: Measuring Cost of Living:

The indifferent curve analysis is used in measuring the cost of living or standard of living in terms of index numbers. We come to know with the help of index numbers whether the consumer is better off or worse off by comparing two time periods when the income of the consumer and prices of two goods change.

Suppose a consumer buys only two goods X and Y in two different time periods 0 and 1 and he spends his entire income on them in the two periods. It is also assumed that the consumer's tastes and quality of the two goods do not change.

Suppose the initial budget line is AB in the base period 0 and the consumer is in equilibrium at point P on the indifference curve I_o in Figure 12.31. The new budget line in period 1 is CD which passes through point P, on the new indifference curve I_1. Both the combinations P and P_1 lie on the original budget line AB.

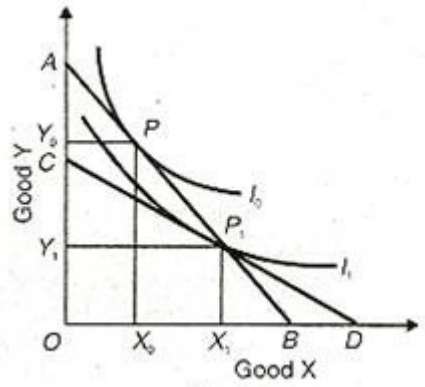


Fig. 12.31

Therefore, they have the same cost. But combination P is on the higher indifference curve I_Q than combination P_1. However, the consumer cannot have combination P at the new price (P,) in period 1. Thus he chooses combination P, on the lower indifference curve I_1 and is worse off in period 1 than in the base period 0. This shows that his standard of living has decreased in period 1 as compared with period 0.

(5) The Supply of Labour:

The supply curve of an individual worker can also be derived with the indifference curve technique. His offer to supply labour depends on his preference between income and leisure and on the wage rate. In Figure 12.32 hours of work and leisure are measured on the horizontal axis and income or money wage on the vertical axis. W_2L is the wage line or income-leisure line whose slope indicates wage rate (w) per

hour. When the wage rate increases, the new wage line becomes W_3L and the wage rate per hour-also increases and similarly for the wage line W_3 L.

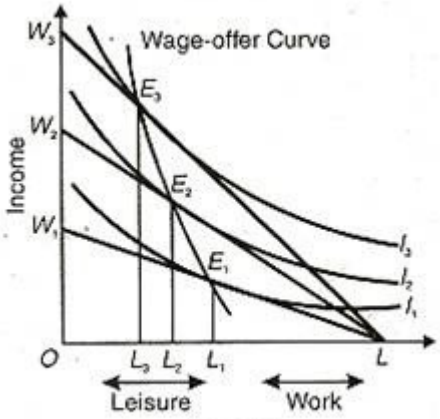


Fig. 12.32

As the wage rate per hour increases, the wage line becomes steeper. When the worker is in equilibrium at the tangency point E_1 of wage line W_1L and indifference curve I_1, he earns E_1L_1 wage by working L_1L hours and enjoys OL_1 of leisure. Similarly, when his wage increases, to L_1, he works for longer hours L_2 L and with E_3 L_3 wage increase, he works for still longer hours L_3 L and enjoys lesser and lesser leisure than before. The line connecting the points E_1E_2 and E_3 is called the wage-offer curve.

The supply curve of labour can be drawn from the locus of the equilibrium points E_1E_2 and But the wage-offer curve is not the supply curve of labour. Rather, it indicates the supply curve of labour. To derive the supply curve of labour from the wage-offer curve given in Figure 12.32, we draw the wage-hour schedule in Table 12.6.

Table 12.6: Wage-Hour Schedule:

Equilibrium Point	Wage Rate Per Hour	Hours Worked
E_1	$OW_1/OL = w_1$	L_1L

E_2	$OW_1/OL = w_2$	L_2L
E_3	$OW_1/OL – w_3$	L_3L

On the basis of the above schedule, the supply curve of labour is drawn in Figure 12.33 where the wage rate per hour is plotted on the vertical axis and hours worked (or supply of labour) on the horizontal axis. When the wage rate is W_1 labour supplied is OL_1. As the wage rate rises to $W_1$and labour supplied increases to OL_2 and OL_1 respectively. The wage-labour combination points E_1E_2 and E_3 trace out the supply of labour curve SS_1. The SS_1 curve is positively sloping upwards from left to right which shows that when the wage rate increases, the worker works for more hours.

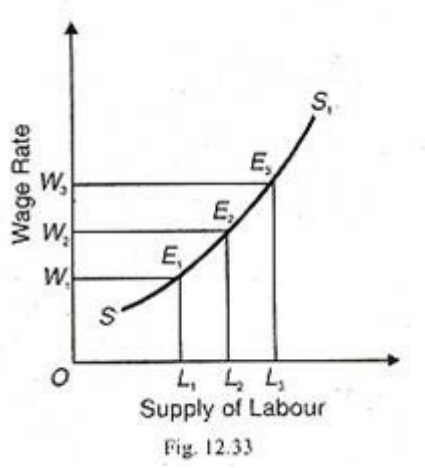


Fig. 12.33

This attitude of the worker is the result of two forces: one, the substitution effect, and two, the income effect of the wage increase. When the wage rate increases, the tendency to work longer hours increases on the part of the worker in order to earn more. It is as if leisure has become more expensive. So the worker has a tendency to substitute work for leisure. This is the substitution effect of the wage increase. Further, when the wage rate increases, the worker becomes potentially better off, he has a feeling of satisfaction and gives preference to leisure over work. This is the income effect of the wage increase. In the figure, as the wage rate increases from W_1 to W_2, hours worked increase from OL_1 to OL_2 and to OL_1. This is because the substitution effect of wage increase is stronger than the income effect.

Backward-Sloping Supply Curve of Labour:

At some higher wage rate if the wage rate increases further, the worker may work for lesser hours and enjoy more leisure. This case is illustrated in Figure 12.34. When the income of the worker increases

progressively from E_1L_1 to E_2L_2 and to E_3L_3, hours worked may decline at some level of income. At the equilibrium point E_1 hours worked are L_1L and they increase to L_2L at the equilibrium point E_2, when his income rises to E_2L_2, from E1L1. But further increase in income to E_3 L_3 leads to the reduction in hours worked to E_3L_3 from L_2L. The worker now increases his leisure hours from OL_2 to OL_3.

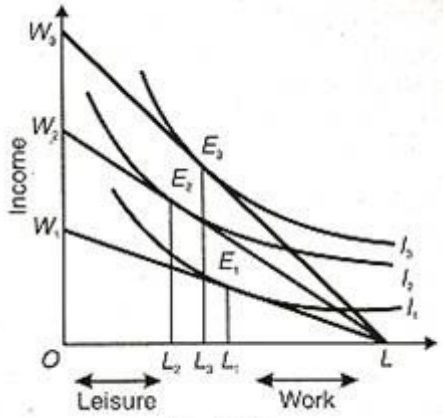


Fig. 12.34

The corresponding supply curve of labour is drawn in Figure 12.35 which is backward slopping. Taking the substitution effect and the income effect of the wage increase up to the wage rate W_2, the substitution effect is stronger than the income effect. So the supply curve of this worker is positively sloped from S to E_2.

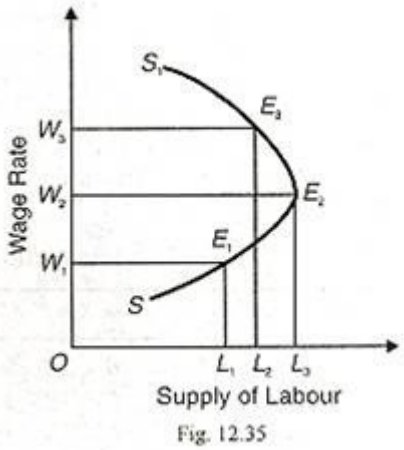


Fig. 12.35

At the wage rate W_2 the substitution effect exactly equals the income effect and the SS_1 curve is vertical at point E_2. As the wage rate increases above W_2, the income effect is stronger than substitution effect and the supply curve is negatively sloped in the region E_2S_1 which shows that the worker gives preference to leisure over work. In the figure, when the wage rate increases to W_3 the worker reduces his hours worked from OL_2 to OL_3 and thus enjoys L_2L_3 of leisure

(6) The Effect of Income Tax vs. Excise Duty:

The indifference curve technique helps in considering the welfare implications of income tax vs. excise duty or sales tax. Whether an income tax hurts the tax payer more or an excise duty of an equal amount? Let us take a taxpayer who is required to pay, say Rs. 4000 annually either as income tax or as excise tax on a commodity X. It is further assumed that he will continue to buy the commodity even after the imposition of the duty when its price goes up.

In Figure 12.36 the money income of the taxpayer is shown along the vertical axis. He has OM of income and his original price-income line, before the tax is levied, is MN. He is in equilibrium at point B on the indifference curve I_1.

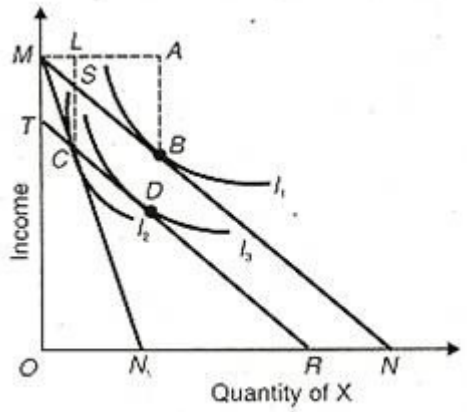


Fig. 12.36

For MA quantity of X, he spends AB. Now when the excise duty on commodity X is levied, its price rises so that his price-income line shifts to MN_1 where he is in equilibrium at point C on the I_1 curve. As a result of the tax, he buys ML quantity of X and spends LC on it. But at the original price, this quantity ML would have cost him LS. Thus SC is the amount of tax which he pay for it.

If an equal amount of tax is raised by the government through income tax instead, the taxpayer's income would be reduced by MT (=SC). He moves to a lower line TR on the indifference curve I_3, at point D. Since the indifference curve I_3 is higher than I_2 the income tax equivalent to an excise duty places the taxpayer in a favourable position.

(7) The Saving Plan of an Individual:

The indifference curve technique can also be used to study the saving plan of an individual. An individual's decision to save depends upon his present and future income, his tastes and preferences for

present and future commodities, their expected prices, on the current and future rate of interest, and on the stock of his savings.

As a matter of fact, his decision to save is influenced by the intensity of his desire for present goods and future goods. It he wants to save more, he spends less on present goods, other things being equal. Thus saving is, in fact, a choice between present goods and future goods. This is illustrated in Figure 12.37 with the help of indifference curves.

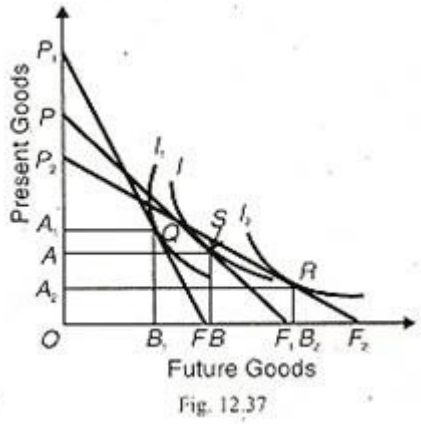


Fig. 12.37

Let PF_1 be the original price-income line of the individual where he is in equilibrium at point S on the indifference curve I.

Given the price of the present and future goods, the income of the consumer, his tastes and preferences for the present and the future, and the rate of interest, he buys OA of the present goods and plans to save so much as to have OB of goods in the future.

Suppose there is a change in his preferences. What will be the effect of such a change on the consumer's saving plan? If his preference for the present goods increases, his price-income line will move to P_1F so that he is in equilibrium at point Q on I_1 He now buys OA, present goods and thus saves less for the future goods. As a result, the purchase of the future goods will fall from OB to OB_1. On the other hand, if in his estimation the value of future consumption increases, his price-income line will move to P_1F where he will be in equilibrium at point R on L curve. He will, therefore, save more and thus reduce his consumption of present goods to OA_2 in order to have OB_2 future goods. Similar effects can be traced if the rate of interest changes, other things remaining constant.

Questions Related to Above Discussion

1. What do you understand by the concept of indifference curve?
2. Explain the assumptions of Indifference curve with the help of examples.
3. What do you understand by marginal rate of substitution?
4. Explain budget line.
5. Explain the properties of Indifference curve.
6. Explain in detail the application of indifference curve with the help of diagram**.**

UNIT-4 PRODUCTION FUNCTION AND COST

1) Production is the process of conversion of inputs into outputs.
2) It is the creation of utility and addition of value
3) Production function is the relationship between inputs & output of a commodity
4) The mathematical expression of production function is
   – $Q_X = f(x1,x2,x3,\ldots\ xn)$
   $O_X \rightarrow$ Output of commodity
   X. f = Function of
   $x1,x2,x3,\ldots x_n \rightarrow$ Inputs
5) The inputs/resources used for production are called factors of production. These are namely land, labour, capital & entrepreneur.

Attributes of production function

1. It indicates a functional relationship between physical inputs and physical outputs. For example, if we have two factors, say, labour (L) and capital (K) then the production function $Q = f(L, K)$
2. The production function is always in relation to a period of time. It denotes the flow of inputs resulting in a flow of outputs during a particular period of time. This is due to the fact when the firm wants to increase the production, it can either employ “some factors” additionally or increase “all the factors” in accordance with availability of the time period. Later we will study it as short period and long period.
3. The production function can specify either the maximum quantity of output that can be produced by a given set of input or the minimum quantity of inputs required for producing certain level of output.

4. The quantity of inputs is dependent upon the state of technology available and firm's managerial ability to use them. In order to simplify things the state of technology is considered to be given.
5. Production function takes into account the most efficient technology and methodology available at a time.
6. Production function is purely a technology relationship between input and output. It has nothing to do with the nominal relationship between input and output. It has nothing to do with the nominal price of factors; or value of quantity produced by them.

Fixed factors & variable factors:

1) **Fixed Factor (FF)**
    a. Fixed factors refer to those factors of production which cannot be changed during short run.
    b. These are used in a fixed quantity in the short run.
    c. These factors can be changed only in the long run.
    d. Example-land, plant and machinery, factory building etc.
2) **Variable Factor (VF)**
    a. Variable factor refer to those factors of production which can be changed during short period.
    b. The quantity of variable inputs varies according to the level of output.
    c. Example-labour, raw material etc.

Time Element in Production
Function Short Run and Long Run

Short Run: Short refer to a period of time in which a firm cannot change its fixed factors of production only variable factors can be changed.
Long Run: Long run refers to a time period during which a firm can change all the factors of production. In the long run, all inputs are variable. Therefore the distinction between fixed factors and variable factors will disappear.

Basic Concepts of Production

1. **Total product or Total physical product (TP or TPP)**
   Total product refers to the total volume of a commodity produced by a firm with given inputs during a given period.
2. **Average product or Average physical product (AP or APP)**
   Average product is per unit product of a variable input
   It is obtained by dividing the total product (TP) by the units of a variable factor.
   Symbolically, $\boldsymbol{AP} = \frac{\boldsymbol{TP}}{\boldsymbol{L}}$
3. **Marginal product or Marginal physical product (MP or MPP)**
   Marginal product is an addition to the total product when an additional unit of variable factor (labour) is employed.

Law of Variable Proportions

The Law of Variable Proportions (also called as returns to factor or Laws of Returns) is discussed under the situation of having one factor variable and another factor being used in fixed quantity if there are only two factors of production. This alters the proportions between factors; therefore, it is called as Law of Variable Proportions. The law is applicable for short run. Here $Q_X=f(L)$.

The law can be explained with the help of below table:

Units of Capital (K)	Units of Labour (L)	TP (Units) (Q)	AP $\left(\frac{Q}{L}\right)$	MP $\left(\frac{\Delta Q}{\Delta L}\right)$	
1	0	0	0	0	
1	1	70	70	70	Stage I
1	2	160	80	90	
1	3	270	90	110	
1	4	360	90	90	
1	5	430	86	70	
1	6	498	83	68	Stage II
1	7	546	78	48	
1	8	546	68.25	0	
1	9	522	58	-24	
1	10	470	47	-52	Stage III

First Stage- Stage of Increasing Returns

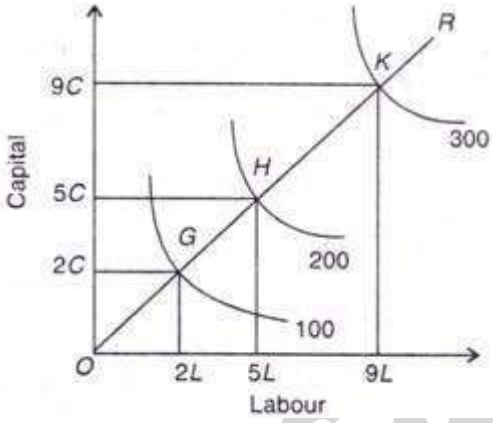
- In this stage as the input of variable factor (labour) increases, marginal product (MP) tends to increase and total product (TP) increases at increasing rate because there is underutilization of the fixed input
- MP also tends to rise alongwith AP.

Second Stage- Stage of Diminishing Returns

- In this stage, increase in the input of variable factor (Labour) is followed by a decrease in MP but it remains positive and TP increases at decreasing rate because there is pressure on fixed input.

Third Stage- Stage of Negative Returns

- In this stage, increase in the units of variable factor (labour) renders MP negative and TP starts declining because there is too much of variable input in relation to the fixed input.



THE LAWS OF RETURNS TO SCALE: PRODUCTION FUNCTION WITH TWO VARIABLE INPUTS

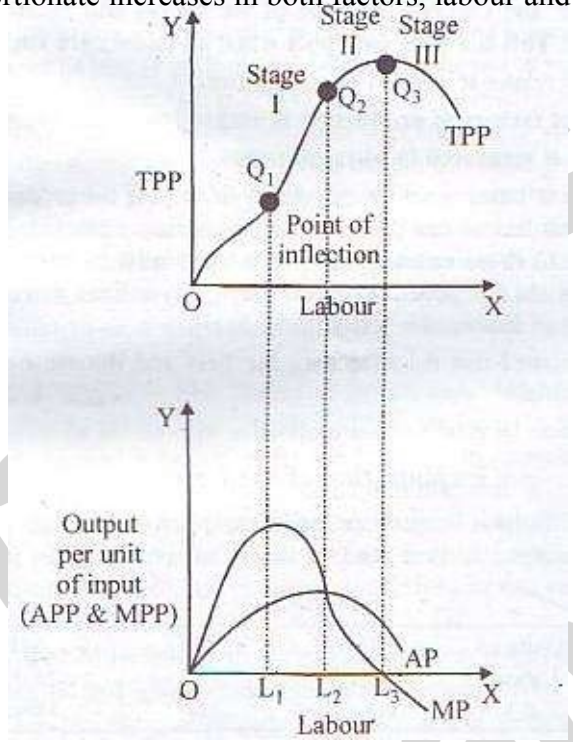
The laws of returns to scale refer to the effects of a change in the scale of factors (inputs) upon output in the long run when the combinations of factors are changed in the same proportion.

If by increasing two factors, say labour and capital, in the same proportion, output increases in exactly the same proportion, there are constant returns to scale. If in order to secure equal increases

in output, both factors are increased in larger proportionate units, there are decreasing returns to scale. If in order to get equal increases in output, both factors are increased in smaller proportionate units, there are increasing returns to scale.

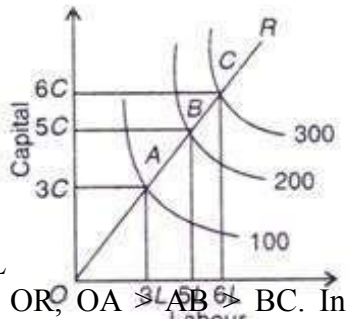
Increasing Returns to Scale:

Below figure shows the case of increasing returns to scale where to get equal increases in output, lesser proportionate increases in both factors, labour and capital, are required



It follows that in the figure:
100 units of output require 3C + 3L 200 units of output require 5C + 5L

300 units of output require 6C + 6L



So that along the expansion path OR, OA > AB > BC. In this case, the production function is homogeneous of degree greater than one. The increasing returns to scale are attributed to the

existence of indivisibilities in machines, management, labour, finance, etc. Some items of equipment or some activities have a minimum size and cannot be divided into smaller units. When a business unit expands, the returns to scale increase because the indivisible factors are employed to their full capacity.

Increasing returns to scale also result from specialisation and division of labour. When the scale of the firm expands there is wide scope for specialisation and division of labour. Work can be divided into small tasks and workers can be concentrated to narrower range of processes. For this, specialized equipment can be installed.

Thus with specialization efficiency increases and increasing returns to scale follow:

Further, as the firm expands, it enjoys internal economies of production. It may be able to install better machines, sell its products more easily, borrow money cheaply, procure the services of more efficient manager and workers, etc. All these economies help in increasing the returns to scale more than proportionately.

Not only this, a firm also enjoys increasing returns to scale due to external economies. When the industry itself expands to meet the increased long-run demand for its product, external economies appear which are shared by all the firms in the industry. When a large number of firms are concentrated at one place, skilled labour, credit and transport facilities are easily available.

Subsidiary industries crop up to help the main industry. Trade journals, research and training centres appear which help in increasing the productive efficiency of the firms. Thus these external economies are also the cause of increasing returns to scale.

Decreasing Returns to Scale:

Below Figure shows the case of decreasing returns where to get equal increases in output, larger proportionate increases in both labour and capital are required.

It follows that:

100 units of output require 2C +
2L 200 units of output require 5C
+ 5L 300 units of output require
9C + 9L

So that along the expansion path OR, OG < GH < HK.

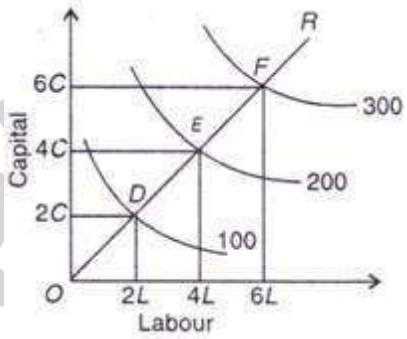
In this case, the production function is homogeneous of degree less than one. Returns to scale may start diminishing due to the following factors. Indivisible factors may become inefficient and less productive. Business may become unwieldy and produce problems of supervision and coordination.

Large management creates difficulties of control and rigidities. To these internal diseconomies are added external diseconomies of scale. These arise from higher factor prices or from diminishing productivities of the factors. As the industry continues to expand the demand for skilled labour, land, capital, etc. rises.

There being perfect competition, intensive bidding raises wages, rent and interest. Prices of raw materials also go up. Transport and marketing difficulties emerge. All these factors tend to raise costs and the expansion of the firms leads to diminishing returns to scale so that doubling the scale would not lead to doubling the output.

Constant Returns to Scale:

Below Figure shows the case of constant returns to scale. Where the distance between the isoquants 100, 200 and 300 along the expansion path OR is the same, i.e., OD = DE = EF. It means that if units of both factors, labour and capital, are doubled, the output is doubled. To treble the output, units of both factors are trebled.



It follows that:

100 units of output require
1 (2C + 2L) = 2C + 2L
200 units of output require
2 (2C + 2L) = 4C + 4L
300 units of output require
3 (2C + 2L) = 6C + 6L

The returns to scale are constant when internal economies enjoyed by a firm are neutralised by internal diseconomies so that output increases in the same proportion. Another reason is the balancing of external economies and external diseconomies.

Constant returns to scale also result when factors of production are perfectly divisible, substitutable, homogeneous and their supplies are perfectly elastic at given prices. That is why, in the case of constant returns to scale, the production function is homogeneous of degree one.

ECONOMIES AND DISECONOMIES OF SCALE

Economies of scale are advantages that arise for a firm because of its larger size, or scale of operation. These advantages translate into lower unit costs (or improved **productive efficiency**), although some economies of scale are not so easy to quantify.

In some markets, firms have to be of at least a certain size to be able to compete at all, because of the minimum level of investment required; economists call this **minimum efficient scale**.

On the other hand, inefficiencies can also creep in because of increased size, known as **diseconomies**

of scale

In the correct sense of the term, **economies and diseconomies of scale** relate to advantages and disadvantages of an ***increase*** in the firm's productive capacity – such as moving to a larger factory or installing completely new technology. Do not confuse these terms with **capacity utilisation**, which is the degree to which the***current*** scale of operations is actually being used.

Economies of scale can be 'internal' (specific to an individual firm) or external (advantages that benefit the industry as a whole).

The main kinds of *internal* **Economies of Scale** are:

Purchasing – firms producing on a larger scale should be able to *bulk buy* raw materials or product for resale in larger quantities. They may be able to cut out wholesalers by buying direct from producers,

and transport costs per unit may also be reduced. The firm might also be buying in large enough quantities to make very specific demands about product quality, specifications, service and so on, so that supplies exactly match their needs.

Technical – it may be cost-effective to invest in more advanced production machinery, IT and software when operating on a larger scale.

Managerial – larger firms can afford to have specialist managers for different functions within a business – such as Marketing, Finance and Human Resources. Furthermore, they may be able to pay the higher salaries required to attract the best people, leading to better planning and decision making.

Specialisation – with a larger workforce, the firm may be better able to divide up the work and recruit people whose skills very closely match the requirements of the job.

Marketing – more options are available for larger firms, such as television and other national media, which would not be cost-effective for smaller producers. The marketing cost for selling 10 million items might be no greater than to sell 1 million items. Larger firms might find it easier to gain publicity for new launches simply because of their existing reputation.

Financial – there is a wider range of finance options available to larger firms, such as the stock market, bonds and other kinds of bank lending. Furthermore, a larger firm is likely to be perceived by banks as a lower risk and the cost of borrowing is likely to be lower.

Risk bearing – a larger firm can be safer from the risk of failure if it has a more diversified product range. A larger firm may have greater resilience in the case of a downturn in its market because of larger reserves and greater scope to make cutbacks.

Social and welfare – larger firms are more likely to be able to justify additional benefits for employees such as pension funds, healthcare, sports and social facilities, which in turn can help attract and retain good employees.

External economies of scale

External economies of scale arise from firms in related industries operating in a concentrated geographical area; suppliers of services and raw materials to all these firms can do so more efficiently. Infrastructure such as roads and sophisticated telecommunications are easier to justify.

There is also likely to be a growing local pool of skilled labour as other local firms in the industry also train workers. This gives a larger and more flexible labour market in the area.

Diseconomies of scale

These are inefficiencies that can creep in when a firm operates on a larger scale (do not confuse with high capacity utilisation). The main diseconomies of scale are:

Lack of motivation – in larger firms, workers can feel that they are not appreciated or valued as individuals - see **Mayo** and **Herzberg**. It can be more difficult for managers in larger firms to develop the right kind of relationship with workers. If motivation falls, productivity may fall leading to inefficiencies.

Poor communication – it can be easier for smaller firms to communicate with all staff in a personal way. In larger firms, there is likely to be greater use written of notes rather than by explaining personally. Messages can remain unread or misunderstood and staff are not properly informed.

Co-ordination – a very large business takes a lot of organising, leading to an increase in meetings and planning to ensure that all staff know what they are supposed to be doing. New layers of management may be required, adding to costs and creating further links in the chain of communication.

FACTORS OF PRODUCTION

FACTORS OF PRODUCTION

1) Production is the process of conversion of inputs into outputs.
2) By production, we mean the process by which man utilizes or converts the natural resources, working upon them so as to make them satisfy human wants.
3) It is the creation of utility and addition of value. This creation of utility may be by way of

creating goods in physical terms (called commodities) or non-physical terms (called services).

4) Production of all goods and services require the use of certain factors (or inputs). The inputs/resources used for production are called factors of production. These are namely land, labour, capital & entrepreneur.

LAND –

The term 'Land' in economics is often used in a wider sense. It does not mean only the surface of the soil, but it also includes all those natural resources which are the free gifts of nature.

It, therefore, means all the free gifts of nature. These natural gifts include: (i) rivers, forests, mountains and oceans; (ii) heat of sun, light, climate, weather, rainfall, etc. which are above the surface of land; (iii) minerals under the surface of the earth such as iron, coal, copper, water, etc. According to Marshall, "By land is meant… materials and forces which nature gives freely for man's aid in land, water, air, light and heat." Therefore, land is a stock of free gifts of nature

Characteristics of Land:

Land possesses the following characteristics:

1. Free Gift of Nature:

Man has to make efforts in order to acquire other factors of production. But to acquire land no human efforts are needed. Land is not the outcome of human labour. Rather, it existed even long before the evolution of man.

2. Fixed Quantity:

The total quantity of land does not undergo any change. It is limited and cannot be increased or decreased with human efforts. No alteration can be made in the surface area of land.

3. Land is Permanent:

All man-made things are perishable and these may even go out of existence. But land is indestructible. Thus it cannot go out of existence. It is not destructible.

4. Land is a Primary Factor of Production:

In any kind of production process, we have to start with land. For example, in industries, it helps to provide raw materials, and in agriculture, crops are produced on land.

5. Land is a Passive Factor of Production:

This is because it cannot produce anything by itself. For example, wheat cannot grow on a piece of land automatically. To grow wheat, man has to cultivate land. Labour is an active factor but land is a passive factor of production.

6. Land is Immovable:

It cannot be transported from one place to another. For instance, no portion of India's surface can be transported to some other country.

7. Land has some Original Indestructible Powers:

There are some original and indestructible powers of land, which a man cannot destroy. Its fertility may be varied but it cannot be destroyed completely.

8. Land Differs in Fertility:

Fertility of land differs on different pieces of land. One piece of land may produce more and the other less.

9. Supply of Land is Inelastic:

The demand for a particular commodity makes way for the supply of that commodity, but the supply of land cannot be increased or decreased according to its demand.

10. Land has Many Uses:

We can make use of land in many ways. On land, cultivation can be done, factories can be set up, roads can be constructed, buildings can be raised and shipping is possible in the sea and big rivers.

LABOUR

Labour includes both physical and mental work undertaken for some monetary reward. In this way,

workers working in factories, services of doctors, advocates, ministers, officers and teachers are all included in labour. Any physical or mental work which is not undertaken for getting income, but simply to attain pleasure or happiness, is not labour.
For example, the work of a gardener in the garden is called labour, because he gets income for it. But if the same work is done by him in his home garden, it will not be called labour, as he is not paid for that work. So, if a mother brings up her children, a teacher teaches his son and a doctor treats his wife, these activities are not considered 'labour' in economics. It is so because these are not done to earn income.

Characteristics of Labour:
Labour has the following peculiarities which are explained as under:
1. Labour is Perishable:
Labour is more perishable than other factors of production. It means labour cannot be stored. The labour of an unemployed worker is lost forever for that day when he does not work. Labour can neither be postponed nor accumulated for the next day. It will perish. Once time is lost, it is lost forever.
2. Labour cannot be separated from the Labourer:
Land and capital can be separated from their owner, but labour cannot he separated from a labourer. Labour and labourer are indispensable for each other. For example, it is not possible to bring the ability of a teacher to teach in the school, leaving the teacher at home. The labour of a teacher can work only if he himself is present in the class. Therefore, labour and labourer cannot be separated from each other.
3. Less Mobility of Labour:
As compared to capital and other goods, labour is less mobile. Capital can be easily transported from one place to other, but labour cannot be transported easily from its present place to other places. A labourer is not ready to go too far off places leaving his native place. Therefore, labour has less mobility.
4. Weak Bargaining Power of Labour:
The ability of the buyer to purchase goods at the lowest price and the ability of the seller to sell his goods at the highest possible price is called the bargaining power. A labourer sells his labour for wages and an employer purchases labour by paying wages. Labourers have a very weak bargaining power, because their labour cannot be stored and they are poor, ignorant and less organised.
Moreover, labour as a class does not have reserves to fall back upon when either there is no work or the wage rate is so low that it is not worth working. Poor labourers have to work for their subsistence. Therefore, the labourers have a weak bargaining power as compared to the employers.
5. Inelastic Supply of labour:
The supply of labour is inelastic in a country at a particular time. It means their supply can neither be increased nor decreased if the need demands so. For example, if a country has a scarcity of a particular type of workers, their supply cannot be increased within a day, month or year. Labourers cannot be 'made to order' like other goods.
The supply of labour can be increased to a limited extent by importing labour from other countries in the short period. The supply of labour depends upon the size of population. Population cannot be increased or decreased quickly. Therefore, the supply of labour is inelastic to a great extent. It cannot be increased or decreased immediately.
6. Labourer is a Human being and not a Machine:
Every labourer has his own tastes, habits and feelings. Therefore, labourers cannot be made to work like machines. Labourers cannot work round the clock like machines. After continuous work for a few hours, leisure is essential for them.
7. A Labourer sells his Labour and not Himself:
A labourer sells his labour for wages and not himself. 'The worker sells work but he himself remains

his own property'. For example, when we purchase an animal, we become owners of the services as well as the body of that animal. But we cannot become the owner of a labourer in this sense.

8. Increase in Wages may reduce the Supply of Labour:

The supply of goods increases, when their prices increase, but the supply of labourers decreases, when their wages are increased. For example, when wages are low, all men, women and children in a labourer's family have to work to earn their livelihood. But when wage rates are increased, the labourer may work alone and his wife and children may stop working. In this way, the increase in wage rates decreases the supply of labourers. Labourers also work for less hours when they are paid more and hence again their supply decreases.

9. Labour is both the Beginning and the End of Production:

The presence of land and capital alone cannot make production. Production can be started only with the help of labour. It means labour is the beginning of production. Goods are produced to satisfy human wants. When we consume them, production comes to an end. Therefore, labour is both the beginning and the end of production.

10. Differences in the Efficiency of Labour:

Labourer differs in efficiency. Some labourers are more efficient due to their ability, training and skill, whereas others are less efficient on account of their illiteracy, ignorance, etc.

11. Indirect Demand for Labour:

The consumer goods like bread, vegetables, fruit, milk, etc. have direct demand as they satisfy our wants directly. But the demand for labourers is not direct, it is indirect. They are demanded so as to produce other goods, which satisfy our wants. So the demand for labourers depends upon the demand for goods which they help to produce. Therefore, the demand for labourers arises because of their productive capacity to produce other goods.

12. Difficult to find out the Cost of Production of Labour:

We can easily calculate the cost of production of a machine. But it is not easy to calculate the cost of production of a labourer i.e., of an advocate, teacher, doctor, etc. If a person becomes an engineer at the age of twenty, it is difficult to find out the total cost on his education, food, clothes, etc. Therefore, it is difficult to calculate the cost of production of a labourer.

13. Labour creates Capital:

Capital, which is considered as a separate factor of production is, in fact, the result of the reward for labour. Labour earns wealth by way of production. We know that capital is that portion of wealth which is used to earn income. Therefore, capital is formulated and accumulated by labour. It is evident that labour is more important in the process of production than capital because capital is the result of the working of labour.

14. Labour is an Active Factor of Production:

Land and capital are considered as the passive factors of production, because they alone cannot start the production process. Production from land and capital starts only when a man makes efforts. Production begins with the active participation of man. Therefore, labour is an active factor of production.

DIVISION OF LABOUR AND EFFICIENCY OF LABOUR

Division of labour first originated from the division of workers in different occupations. Now, when the production is done on a large scale with the help of heavy machines, it is split up into a number of processes and many people join to produce an article.

It is called the division of labour. For instance, in a large scale readymade garment factory, a man does cutting of cloth, the second man stitches clothes with machines, the third buttons, the fourth makes folding and packing, etc.

This way of doing the work is called division of labour because different workers are engaged in performing different parts of production. In the words of Watson, "Production by division of labour consists in splitting up the productive process into its component parts."

In fact, one cannot produce all the goods he requires. Production has become so technical and complex that different workers are put to different tasks according to their capacity and ability. One becomes specialised in the production of those goods for which he or she is best suited. Different workers perform different parts of production on the basis of their specialisation.
The result is that goods come to the final shape with the cooperation of many workers. Thus, division of labour means that the main process of production is split up into many simple parts and each part is taken up by different workers who are specialised in the production of that specific part.

Forms of Division of Labour:
The division of labour has been divided into different forms by the economists which can be explained as follows:
1. Simple Division of Labour:
When the production is split up into different parts and many workers come together to complete the work, but the contribution of each worker cannot be known, it is called simple division of labour. For example, when many persons carry a huge log of wood, it is difficult to assign how much labour has been contributed by an individual worker. It is simple division of labour.
2. Complex Division of Labour:
When the production is split up into different parts and each part is performed by different workers who have specialised in it, it is called complex division of labour. For example, in a shoe factory one worker makes the upper portion, the second one prepares the soles, the third one stitches them, the fourth one polishes them, and so on. In this way, shoes are manufactured. It is a case of complex division of labour.
3. Occupational Division of Labour:
When the production of a commodity becomes the occupation of the worker, it is called occupational division of labour. Thus, the production of different goods has created different occupations. The caste system in India is perhaps the best example of the occupational division of labour. The work of farmers, cobblers, carpenters, weavers and blacksmiths isknown as occupational division of labour.

4. Geographical or Territorial Division of Labour:
Sometimes, due to different reasons, the production of goods is concentrated at a particular, place, state or country. This particular type of division of labour comes into being when the workers or factories having specialised in the production of a particular commodity are found at a particular place. That place may be the most suitable geographically for the production of that commodity. This is called the geographical or territorial division of labour. For example, Assam has specialised in the production of tea, whereas the textile industry is localised in Mumbai and the jute production in West Bengal.
Merits and Demerits of Division of Labour:
Division of labour possesses the following merits and demerits:

Its Merits:
Division of labour has the following merits:
1. Increase in Production:
With the adoption of division of labour, the total production increases. Adam Smith has explained the advantage of division of labour with the help of an example that a worker can produce only 20 pins daily. If the making of pins in a modern factory is divided into 18 processes, then 18 workers can produce 48,000 pins in a single day.
2. Increase in Efficiency of Labour:
With division of labour, a worker has to do the same work time and again, and he gets specialisation in it. In this way, the division of labour leads to a great increase in efficiency.
3. Increase in Skill:
Division of labour contributes to the development of skill, because with the repetition of the same

work, he becomes specialised in it. This specialisation enables him to do the work in the best possible way, which improves his skill.

4. Increase in Mobility of Labour:

Division of labour facilitates greater mobility of labour. In it, the production is split up into different parts and a worker becomes trained in that very specific task in the production of the commodity which he performs time and again. He becomes professional, which leads to the occupational mobility. On the other hand, division of labour implies a large-scale production and labourers come to work from far and near. Thus, it increases geographical mobility of labour.

5. Increase in Use of Machines:

The division of labour is the result of the large-scale production, which implies more use of machines. On the other hand, the division of labour increases the possibility of the use of machines in the small- scale production also. Therefore, in modern times the use of machines is increasing continuously due to the increase in the division of labour.

6. Increase in Employment Opportunities:

Division of labour leads to the diversity of occupations which further leads to the employment opportunities. On the other hand, the scale of production being large, the number of employment opportunities also increases.

7. Work According to Taste:

Workers have their own taste in production. For example, a person can take up that type of job for which he considers himself to be the most suitable and which is in accordance with his taste. Division of labour extends the work to such an extent that every person can find work according to his taste and interest.

8. Work for Disable:

Division of labour splits up the production work in small processes and different persons can work at different places with the help of machines. Certain machines can be operated with the help of hands only and others with the help of foot as well. Therefore, the disabled persons can also find work according to their suitability.

9. Best Use of Tools:

In this system, it is not necessary to provide each worker with a complete set of tools. He needs a few tools only for the job in which he can make their best use. Therefore, the continuous use of tools is possible which are used at different stages.

10. Best Selection of the Workers:

Division of labour helps the employers in the best selection of workers.

As the work is divided into different parts and each part is taken up by such a worker who is more suitable for it, the employer can select very easily the man who is best suited for the work.

11. Saving of Capital and Tools:

Division of labour helps in the saving of capital and tools. It is not essential to provide a complete set of tools to every worker. He needs a few tools only for the job he has to do. Thus there is the saving of tools as well as capital. For instance, if a tailor stitches the shirt, he requires a sewing machine, scissors, etc. But on the basis of division of labour, one can do the cutting and the other can stitch the clothes. In this way, two tailors can work with the help of one pair of scissors and one machine only.

12. Goods of Superior Quality:

Division of labour is beneficial in making goods of superior quality. When the worker is entrusted with the work for which he is best suited, he will produce superior quality goods.

13. Saving of Time:

There is no need for the worker to shift from one process to another. He is employed in a definite process with certain tools. He, therefore, goes on working without loss of time, sitting at one place. Continuity in work also saves time and helps in more production at less cost.

14. Right Man at the Right Job:

Division of labour implies splitting up of production into a number of processes. Each person is

given the job for which he is best suited. There will be no round pegs in square holes. In this way, a right man is placed at the right job.

15. Reduction in the Cost of Production:
If a shoe-maker makes himself two pairs of shoes daily, then four shoe-makers can make more than eighth pairs of shoes if they work in cooperation with each other. In this way, division of labour increases production which reduces the average cost of production. Saving of capital, tools and machinery, etc. also help in the reduction of cost of production.

16. Cheap Goods:
Division of labour helps in mass production. Thus production becomes less expensive and more economical. Therefore, cheaper goods are turned out, which improve the standard of living of the people.

17. Saving of Time and Expenses in Training:
Under division of labour, a worker has to train himself in a small part of production. There is no need to learn the whole process of production. It ensures saving of time as well as expenses in training.

18. Spirit of Co-operation among Workers:
Division of labour gives chances of working under the same roof and with the cooperation of each other. It further gives rise to the feeling of cooperation and trade unionism in their daily lives. The work cannot be completed unless they cooperate with each other. They help each other at the time of adversities as well.

19. Development of International Trade:
Division of labour increases the tendency of specialisation not only in the workers or industries, but in different countries also. On the basis of specialisation, every country produces only those goods in which it has a comparative advantage and imports such goods from those countries which have also greater comparative advantage. Therefore, division of labour is beneficial for the development of international trade also.

Its Demerits:
The division of labour has also certain demerits which are explained below:

1. Monotony:
Under division of labour, a worker has to do the same job time and again for years together. Therefore, after some time, the worker feels bored or the work becomes irksome and monotonous. There remains no happiness or pleasure in the job for him. It has an adverse effect on the production.

2. Loss of Joy:
In the absence of division of labour, he feels a lot of pleasure on the successful completion of his goods. But under division of labour, nobody can claim the credit of making it. The work gives him neither pride nor pleasure. Therefore, there is total loss of joy, happiness and interest in the work.

3. Loss of Responsibility:
Many workers join hands to produce a commodity. If the production is not good and adequate, none can be held responsible for it. It is generally said that ‘every man’s responsibility is no man’s responsibility.’ Therefore, the division of labour has the disadvantage of loss of responsibility.

4. Loss of Mental Development:
When the labourer is made to work only on a part of the work, he does not possess complete knowledge of the work. Thus, division of labour proves to be a hurdle in the way of mental development.

5. Loss of Efficiency:
Division of labour is sometimes accounted for the loss of efficiency. For instance, if a cobbler goes on cutting the leather for a long time, he may lose the efficiency of making shoes.

6. Reduction in Mobility of Labour:
The mobility of labour is reduced on account of division of labour. The worker performs only a part

of the whole task. He is trained to do that much part only. So, it may not be easy for him to trace out exactly the same job somewhere else, if he wants to change the place. In this way, the mobility of labour gets retarded.

7. Increased Dependence:

When the production is split up into a number of processes and each part is performed by different workers, it may lead to over-dependence. For instance, in the case of a readymade garments factory, if the man cutting cloth is lazy, the work of stitching, buttoning, etc. will suffer. Therefore, increased dependence is the result of division of labour.

8. Danger of Unemployment:

The danger of unemployment is another disadvantage of division of labour. When the worker produces a small part of goods, he gets specialised in it and he does not have complete knowledge of the production of goods. For instance, a man is expert in buttoning the clothes. If he is dismissed from the factory, it is difficult for him to find the job of buttoning. Thus division of labour has a fear of unemployment.

9. Increased Dependence on Machines:

As division of labour increases, there will be an increased use of machines. Almost all the workers work on different types of machines. It is difficult for them to work without machines. Thus, division of labour increases the dependence on machines.

10. Danger of Over-Production:

Over-production means that the supply of production is comparatively more than its demand in the market. Because of the division of labour, when production is done on a large scale, the demand for production lags much behind its increased supply. Such conditions create overproduction which is very harmful for the producers as well as for the workers when they become unemployed.

11. Exploitation of Labour:

Division of labour is concerned with large scale production in big factories which are owned by the capitalists. No poor worker can afford to start his own production. Therefore, they have to seek employment in big factories of the capitalists. These employers pay less wages to them as compared to their marginal productivity, because there is no other alternative to the workers but to work at very low wages. Therefore, division of labour results in the exploitation of labour.

12. Evils of Factory System:

The modern industrial or factory system has been developed as a result of the division of labour. This system further gives rise to the evils like dense population, pollution, bad habits of gambling and drinking, low standard of living, poor food, clothes and housing, etc.

13. Employment of Women and Children:

Division of labour results in the large scale production in which children and women are also employed. It is because a simple and small part of the whole task can easily be performed by them. Thus the number of employed women and children increases. They are also exploited by the employers by paying them lower wages.

14. Industrial Disputes:

The industrial disputes mean strikes by workers, closure of factory, etc. due to clashes between the employees and the employers. Division of labour results in the division of society into workers and employers. The employer always tries to increase his profits by exploiting the workers and workers form trade unions against the employers to put an end to their exploitation or to make them increase their wages. It gives rise to a severe conflict between the employers and the workers in the form of strikes, closures and lockouts of factories.

Conclusion:

To sum up, we can say that division of labour is beneficial to the workers, to the producers and to the society as a whole. Its merits outweigh its demerits.

EFFICIENCY OF LABOUR :- The working capacity of the labour is called his efficiency being given the same time limit and given the same type of work.

FACTORS DETERMINING THE EFFICIENCY OF LABOUR

1. PERSONAL QUALITIES :- Some people have some personal qualities and they are suitably built foe certain heavy labour. On other hand some people are very suitable for mental labour. Family background also pays very important role in this regard.

2. EDUCATION :- It is the basic and essential element which determines the efficiency of labour. Educated labourer is more efficient as compared to the illiterate worker.

3. TRAINING AND SKILL :- The modern world requires highly skilled labourers. A labourer with sound technical training will be more effective as compared to a labourer who has no training. It increases the efficiency of the labourer.

4. CLIMATIC CONDITIONS :- Climates also plays an important role in increasing or decreasing the efficiency. Hot weather has a vital factor for the low efficiency of labour in Asia and Middle East. On other hand cold weather is an important element for increasing the efficiency in labour in U.S.A and Europe.

5. WAGES AND BENEFITS :- If wages, allowances, bonuses and other frigs benefits are given to the workers, then their working efficiency increases. Labourer works very hard if he has attractive salary. On other hand if wages rate is low then efficiency of the labourer will be also low.

6. COMBINATION OF PRODUCTION FACTORS :- If the other three factors of production combination is ideal then efficiency of labourer will be high otherwise low.

7. WORKING HOURS :- If working hours of labourer are reasonable then the efficiency will be high. If the working time is very long and without extra payment then efficiency of the worker will be low.

8. ENVIRONMENT :- If the working environment is pleasant then efficiency of labourer will be high. It is observed that labourer working in air conditions rooms and healthy conditions are more efficient as compared to others.

9. RACIAL QUALITIES :- By birth some races are very hard working and strong built so they are more efficient as compared to other races.

FACTORS PROMOTING EFFICIENCY OF LABOUR

Following are the important factors which promote the efficiency of labour.

1. INCREASE IN WAGES :- Increase in wages and fringe benefits promote the efficiency of labour. When wages and incentives will increase it will make the labourer hard worker and efficient.

2. TECHNICAL EDUCATION :- Vocational, technical and commercial colleges, should be opened to provide technical skill to the people. Modern industry, agriculture, banking, transport and commerce require highly skilled persons. Such type of training and skill is provided in the colleges and universities.

3. CARE OF HEALTH :- Health facilities should be provided to the labourers. A healthy worker can work more efficiently as compared to sick worker. All the factory owners should opened the

health clinics in their factories and regular medical check-up should be compulsory.

4. INCREASES IN ALLOWANCES :- Various types of allowances like dearness and bonus must be increased. Special allownces should be given to the efficient workers.

5. LABOUR LAWS :- Government should also frame the strict labour laws. In case of accident special compensation should be given. In case of industrial dispute courts should be established. This step will provide the security to the labourers and they will work with full concentration.

6. SPECIAL STORES :- To provide the goods on lower rates to the labourers special stores should be opened for the workers.

7. ESTABLISHMENT OF THE CANTEEN :- Lunch and dinner facility should be provided to the workers. On the lower rates food should be provided during the working interval. In this way time of the workers will be saved and their efficiency will increase.

MOBILITY OF LABOUR

Mobility refers to the willingness and actual movement of labour from one place to another-near or far and distant. This mobility may be for searching jobs or for better job prospects. This mobility may be territorial, occupational or intra-regional.

FACTORS AFFECTING MOBILITY OF LABOUR:

1) Means of transport and communication
2) Knowledge and Information
3) Stage of development
4) Family bonds
5) Urge to excel

CAPITAL

Meaning

The term, 'Capital', in economics does not mean merely money as the accountants call it. Capital is that part of wealth which can be used for further production of wealth. According to Marshall, "Capital consists of all kinds of wealth, other than free gifts of nature, which yield income." Therefore, every type of wealth other than land which helps in further production of income is called capital.

In this way, money, machine, factories, etc. are included in capital provided they are used in production. For instance, if a man has an income of Rs 10,000 per month and out of it he invests Rs 6,000 in a business, this amount of Rs 6000 is called capital. In the same way, plough, tractor and other agricultural implements of farmers are also capital. The house in which a man resides is his wealth and the house which is given on rent is his capital.

Characteristics of Capital:

Capital has its own peculiarities which distinguish it from other factors of production. Capital possesses the following main characteristics:

1. Man Produces Capital:

Capital is that wealth which is used in the production of goods. Capital is the result of human labour. Thus, every type of capital such as roads, machines, buildings and factories etc. are produced by man. It is a produced factor of production.

2. Capital is a Passive Factor of Production:

Capital cannot produce without the help of the active services of labour. To produce with machines, labour is required. Thus, labour is an active, whereas capital is a passive factor of production. Capital

on its own cannot produce anything until labour works on it.

3. Capital is a Produced Means of Production:

The composition or supply of capital is not automatic, but it is produced with the joint efforts of labour and land. Therefore, capital is a produced means of production.

4. Capital is Variable:

The total supply of land cannot be changed, whereas the supply of capital can be increased or decreased. If the residents of a country produce more or save more from their income, and these savings are invested in factories or capital goods, it increases the supply of capital.

5. Capital is more Mobile than other Factors of Production:

Of all the factors of production, capital is the most mobile. Land is perfectly immobile. Labour and entrepreneur also lack mobility. Capital can be easily transported from one place to another.

6. Capital Depreciates:

As we go on using capital, the value of capital goes on depreciating. When machines are used continuously for some time, these depreciate and their value falls.

7. Capital is Stored-up Labour:

Scholars like Marx admit that capital is stored-up labour. By putting in his labour man earns wealth. A part of this wealth is spent on consumption goods and the rest of it is saved. When saving is invested, it becomes capital. In other words, capital is the result of accumulation of savings of a man. Therefore, capital is stored-up labour.

8. Capital is Destructible:

All capital goods are destructible and are not permanent. Because of the continuous use, machines and tools become useless with the passage of time.

Classification of Capital

The functional classification of capital is as follows:

1) **Real capital and financial capital:** Real capital refers to physical goods (capital goods as they are known to be) used for further production like, equipments, machinery, structure, plants etc. Financial capital is monetary resources available for investment into these physical goods.
2) **Private capital and social capital:** Private capital includes the amount and type of investment made by the private sector, usually, for earning some profits. Social capital, on the other hand, is created and developed by the state, for example, construction of roads, bridges, educational institutions and some such economic organizations.
3) **Fixed and Floating capital:** The long-term capital like plant and machinery is fixed capital whereas cash, inventories required for production is floating or circulating capital.
4) **Tangible and Intangible capital:** Any capital which has physical manifestation like plant and machinery, building etc. is called tangible capital, Intangible capital is, which is not physically existing but contributing to the production of goods and services like goodwill, brand image etc.
5) **Indigenous and Foreign capital:** Such capital having its sources from within the country is called indigenous capital whereas the capital, in any form, brought from abroad is called foreign capital.

Capital Formation

Production is an ongoing process. Whatever amount of goods and services are produced in a certain period of time (usually in a year) is not consumed instantaneously. A part of it is set aside for "Some future use" in production. This keeps on increasing and used for further production sometime somewhere. This 'setting aside of a portion of current production' and used for further production is known as 'capital formation'. We may define capital formation as the surplus of production over consumption in a certain period which is used for further production.

Role of Capital:

1) Capital formation plays a very crucial role in the process of economic development of a country. Higher the rate of capital formation higher will be the growth prospects of the economy. The fact is that capital formation shows the potentials of the economy.
2) Another contribution of capital accumulation (or formation) is that it makes the technology development possible in an economy. Without capital formation, new discoveries, inventions will remain unused and efforts in researching and developing them will go waste.
3) Capital formation also creates job opportunities in the economy both at the level of production of capital and at the level of utilization of such capital.

Stages of Capital Formation:

- **Stage 1:** Savings
- **Stage 2:** Mobilisation of Savings
- **Stage 3:** Investment

ORGANIZATION AND ENTERPRISE (ENTREPRENEURSHIP)

Features of Entrepreneurship

The entrepreneur as an organizer of the process of production is the fore-runner of economic development of a country.

1. Scare human resource

Entrepreneurship is a very scarce human factor as it involves specific talent, organizational capacity, innovative sprit and boldness to bear risk which is not found in every person. In developing countries like India lack of entrepreneurship is a major impediment to development.

2. Heterogeneous factor

Entrepreneurship is a heterogeneous factor of production because efficiency, talents, organizing skills, ability to bear risk, foresights and innovating capacities, etc. vary from entrepreneur to entrepreneur. The nature of enterprise varies with various forms of business organizations like sole trading, partnership, co-operatives, Joint Stock Company and public undertakings. In a small business, the same person may work as an entrepreneur, manager and capitalist.

3. Indispensable factor

In modern business entrepreneur is a very important factor of production as he organizes production of goods & services by coordinating the other factors in an optimum way. He is an organiser & owner of the firm. Production is impossible in his absence.

4. Intangible factor

Entrepreneurship is an abstract phenomenon. It is intangible. Entrepreneurial efforts cannot be measured in quantitative terms while we can measure in terms of hours of work and number of days. We can calculate the number of individual workers and their contribution to the firm but it is not possible to measure entrepreneurship as the firm itself is the enterprise.

5. Highly mobile

Of all factors entrepreneur possess a higher degree of mobility as he can easily move from one industry to another or from one region to another. An entrepreneur's ability to move from one industry to another depends upon his knowledge, experience and specialization.

6. Cannot be Bought & Sold

Land labour and capital can be bought and sold in factor markets but it is not possible to deal with entrepreneurs in a factor market. Since enterprise is an intangible factor, it cannot be bought and sold. Hence, like land, labour and capital market there is no entrepreneurial market where entrepreneurship can be bought and sold. Transaction is not possible in case of enterprise.

We cannot derive the demand and supply curves in case of entrepreneur. Hence, the Demand and Supply Theory of value cannot be applied to the factor enterprise or organization to determine its

price.

7. Residual reward

Entrepreneurship is a reward in terms of profit which is a residual reward, i.e. an income which is left after meeting all business expenses from the total sales revenue.

Functions of an Entrepreneur:

1) Co-ordinating functions
2) Risk bearing functions
3) Innovating functions

COST CONCEPTS

Cost may be defined as price paid for different factors of productions involved in producing certain commodities.

ELEMENTS OF COST

(1) Money Cost:- It is the cost which is expressed or calculated in monetary terms and is based on accountant's point of view.

Money cost has three elements:-

(a) **Explicit Cost: -** Cost consist of all the payments made on basis of contract to various factors of production employed by a firm namely prices paid for raw materials, rent, wages, salaries etc.

(b) **Implicit Cost: -** Payment made to owned factors of production like owned capital, owned labour etc are called implicit cost. These factors of production are personally owned by the producer/ firm used for the business purpose.

(c) **Normal Cost: -** It is the minimum profit a firm should get in order to remain in an industry. It is over explicit and implicit cost of a firm.

Money Cost = Explicit cost+ Implicit Cost + Normal Profit

(2) Real Cost:- This type of cost is calculated by a sociologist. He is concerned with pains, sacrifices and efforts made by the society in production of a commodity.

(3) Opportunity Cost:- It is also called alternative cost or transfer cost. Opportunity cost is the cost sacrificed for one alternative for obtaining the next best possible alternative. For ex. Commodity x is produced by sacrificing the production of y commodity so opportunity cost of x will be the cost of production of y commodity.

(4) Direct Cost And Indirect Cost :- Direct cost is the cost directly concerned with the production of commodity. ex:- Cost on raw material, wages, fuel etc. where as indirect cost is the cost which is not directly concerned with the production of commodity. For ex: supervision, administration cost, rent, office overheads etc.

(5) Incremental Cost And Sunk Cost:- Cost incurred when a business firm changes its business activities or nature of business operation is called on incremental cost.

Incremental Cost = Changed total cost – Initial total cost

Sunk cost are those cost which are not affected by the changes in the level of business activity or nature of business firm. These costs once incurred cannot be recovered easily.

Ex.;- Depreciation

(6) Fixed Costs And Variable Costs:- Fixed cost are those costs which are fixed weather production is being carried or not. Variable cost are those costs which vary with the change in production process. If there will be no production these costs will not incurred.

(7) Short Run And Long Run Costs :- Short run cost are those which are concerned with short run production of a firm i.e. fixed cost and variable costs.

Long run cost are concerned with long run production of a firm where all factors of production are variable and all cost are variable costs.

COST – OUTPUT RELATION DURING SHORT RUN

During short run time period two types of factors of production are employed under which one is fixed factor an others are variable factors of production. Raw material, semi finished material, unskilled labour, energy etc are variable inputs which can be changed during short run, Machines, Capital, Infrastructure, Salaries of managers etc are fixed inputs.

SHORT RUN COST

1. **Total Fixed Cost (TFC):-** Those cost which remain constant when the output is zero as well as it does not increases with increase in production are called total fixed cost (TFC).
   For Ex:- Plant, Land, Building, Machinery, Tools, Equipments, Insurance, Salaries of manager etc.
2. **Total Variable Cost (TVC):-** Those costs vary with the production of a commodity during short period and have direct relation with the change in production a called total variable costs (TVC). These costs are also called prime cost are direct costs. It increases with increase in production of output.
3. **Total Cost:-** Aggregate of total fixed cost and total variable cost increased by a firm in the production of any commodity is called total cost.
   Total cost (TC) = Total Fixed cost + Total Variable Cost
   (TVC) Total cost increases with change in output.

AVERAGE OR PER UNIT COST

1. **Average Fixed Cost:-** Average fixed cost is total fixed cost divided by the volume of output. AFC has inverse relation with output and it decreases with increase and increases with decrease in output. AFC curve in rectangular hyperbola in shape.
   AFC = TFC / Output

   i.e. $\frac{\text{Total Fixed Cost}}{\text{Output (in Units)}}$

2. **Average Variable Cost (AVC):-** Average variable cost is total variable cost divided by the volume of output. AVC falls with increase in output reaches its minimum and then starts rising. It is due to operation of law of returns. Shape of AVC curve is U shaped because of operation of law of returns where at 1st stage i.e. during law of increasing returns production rises and cost decreases then at 2nd stage i.e. laws of constant & diminishing returns cost reaches at minimum and remains constant and at 3rd stage i.e. law of negative returns cost starts increasing.
AVC = TVC / Output

i.e. Total Fixed Cost
Output (in Units)

3. **Average Costs (AC):-** Average cost or average total cost (ATC) is the aggregate of AFC & AVC. AC = TC / Output i.e. = Total cost / Output Or AC = AFC + AVC
AC curve decreases with increase in output remains constant up to a point and then increases with increase in output.

4. **Marginal Cost (MC):-** Marginal cost is additional cost incurred in producing an additional unit of output.
MC = Δ TC / Δ Output
Marginal cost changes with the change in AVC and is independent of fixed cost. MC falls in beginning reaches at its minimum and there after rises. MC is also a U shaped curve.

Output	Total Cost			Average Costs			
	TFC	TVC	TC	AFC	AVC	AC	MC
0	100	0	100	0	0	0	---
1	100	30	130	100	30	130	30
2	100	60	160	50	30	80	30
3	100	80	180	33.3	26.7	60	20
4	100	90	190	25	22.5	47.5	10
5	100	100	200	20	20.0	40.0	10
6	100	120	220	16.66	20.0	36.6	20
7	100	150	250	14.3	21.4	35.7	30
8	100	190	290	12.5	23.7	36.2	40
9	100	240	340	11.1	26.6	37.7	50
10	100	320	420	10	32.0	42.0	80

In above table TFC remains constant and TVC goes on increasing and TC is also increasing with increase in output. AFC is decreasing with increase in output. AVC decreases reaches to minimum and then increasing. AC decreases reach to minimum and then increase. MC decreases reach to minimum remains constant and then increases.

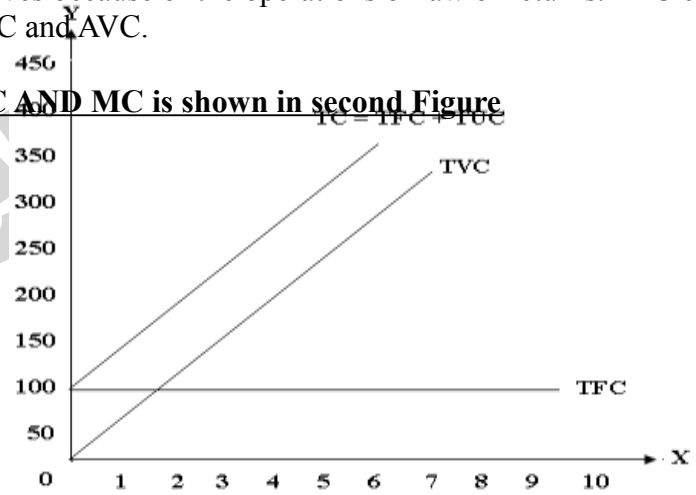
DIAGRAM 1st

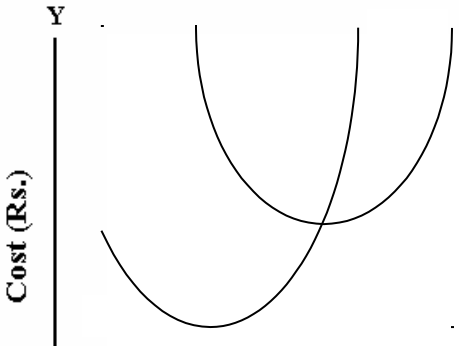
Output (In Units)

TFC remains constant weathers production is zero or 10units. TVC starts from O units and increases with increase in output. TC is the total of TVC and TFC.

AC, MC and AVC are U shaped curves because of the operations of law of returns. AFC curve shows a decreasing trend. MC curve passes through minimum point, point of AC and AVC.

RELATIONSHIP BETWEEN AC AND MC is shown in second Figure





(1) AC and MC fall in beginning but MC falls more rapidly than AC and MC is below AC or vice versa (AC > MC).
(2) When AC rises MC also rises but rises rapidly than AC and MC is more than AC or vice versa.(MC > AC)
(3) When AC is minimum it is equal to MC curve cuts AC curve at its minimum point.(MC=AC)

COST OUTPUT RELATION DURING LONG RUN

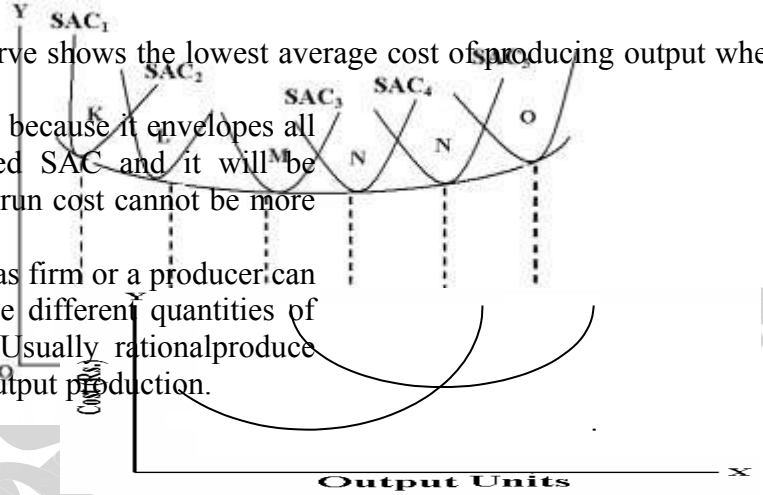
Long period gives sufficient time to business managers to change even the scale of production. All the factors of production are variable. All cost are variable and there is no fixed cost. In long run there is long run average cost curve and long run marginal cost curve.

Long Run Total Cost (Ltc) :- The long run total cost of production is the least possible cost of producing any given level of output when all inputs are variable.

Long Run Average Cost (Lac):- Long run average cost curve shows the lowest average cost of producing output when all inputs can be varied. LAC is also known by fallowing names:-

(1) **Envelope Curve**:- LAC is also known as envelop curve because it envelopes all the SAC curves. It indicates that LAC cannot exceed SAC and it will be surrounding the SAC, and does not rise upwards. Long run cost cannot be more than than short run cost.

(2) **Planning Curve:-** Lac is also known as planning curve as firm or a producer can decide that which plant size should be used to produce different quantities of output so that production is done at minimum cost .Usually rationalproduce selects plant size where LAC is at its minimum for the output production.



In above fig. LAC is shown which is tangent to all SAC curves.
In order to produce OQ3 level of output corresponding point an LAC is K which is tangent to SAC1 and therefore.

LONG RUN MARGINAL COST (LAC)

Long – run marginal cost curve is that which shows the extra cost incurred in producing one more unit of output when all inputs can be changed.

LMC = LTC
Q

RELATION BETWEEN LAC AND LMC

Relation between long-run marginal cost and long-run average cost is similar to that of what it is in short run AC and MC. The only difference in long run AC and MC is that long run MC and AC curve are more flat to than that of SAC and SMC, it is so because in long run all factors of production are variable and firm selects appropriate scale of production at minimum cost so cost increase in long run is gradual in comparison to short run curves. LAC is also a expanded U Shaped curve because of operation of laws of returns to scale.
As firm expend their output scale of operation also increased by firm so they will enjoy economies of scale but if these firm produce beyond their installed capacity of scale that results in increase in cost gradually.

CONCEPTS OF REVENUE

In economics revenue is studied in terms of total revenue (TR), Average revenue (AR) and marginal revenue (MR).

Total Revenue:- Total revenue is the total money receipts of a firm or producer with sales of its output.

TR = Q x P

i.e. quantity of goods sold x price per unit.

Average Revenue:- It is average pr unit of sale of output. It is also called. Price per unit of output.

AR = TR / O

i.e. total revenue / No. of output sold.

Marginal Revenue:- It is an addition to the total revenue when an additions unit of output is sold by a firm.

MR = ΔTR / ΔR

Δ TR = Change in Total Revenue

Δ O = Change in Output

or MR = TR n – TR n-1

TR = Total Revenue

TR_n = Total Revenue of n products

TR_{n-1} = Total Revenue of n-1 products.

INTER RELATIONSHIP AMONG CONCEPTS OF REVENUE

Units of output sale	Price per units (Rs.)	TR	AR	MR
1	12	12	12	12
2	11	22	11	10
3	10	30	10	8
4	9	36	9	6
5	8	40	8	4
6	7	42	7	2
7	6	42	6	0
8	5	40	5	-2

Table shows that with increase in output unit sale price per unit decreases and TR increases reaches to maximum remains constant and declines. AR falls with every unit of output sold and is equal to price. MR will also decrease at increasing rate reaches to0 and then becomes negative. AR and MR is decreasing but AR is positive and MR has three trends decreases, becomes zero and negative. Fall in AR is less than MR (AR > MR) when MR is O then TR will be at its maximum.

Units of output sale	Price per units (Rs.)	TR	A R	MR
1	12	12	12	12
2	11	22	11	10
3	10	30	10	8
4	9	36	9	6
5	8	40	8	4
6	7	42	7	2
7	6	42	6	0
8	5	40	5	-2

TR, AR and MR are revenue curves shown on OY axis output is shown on OX axis. A to B is increasing stage of TR. B to C is constant and C to D is decreasing stage of TR. AR and MR are falling but AR is above the MR (AR > MR). MR will be negative when TR falls.

Relation between AR and MR

Under different market conditions the relation between AR and MR can be as given below:

AR and MR under perfect Competition

Under perfect competition price remains constant. Price, AR and MR will be the same and the demand curve will be horizontal to OX-axis because there is a large number of buyers and sellers, homogeneous product and price is determined by the total demand and supply, firm is a price taker, Hence, there is one price prevailing in the market. It can be seen from the following table:-

AR and MR under Perfect competition

Units of Output	Price per Unit (Rs.)	TR (Rs.)	AR (Rs.)	MR (Rs.)
1	5	5	5	5
2	5	10	5	5
3	5	15	5	5
4	5	20	5	5

5	**5**	**25**	**5**	**5**
6	**5**	**30**	**5**	**5**

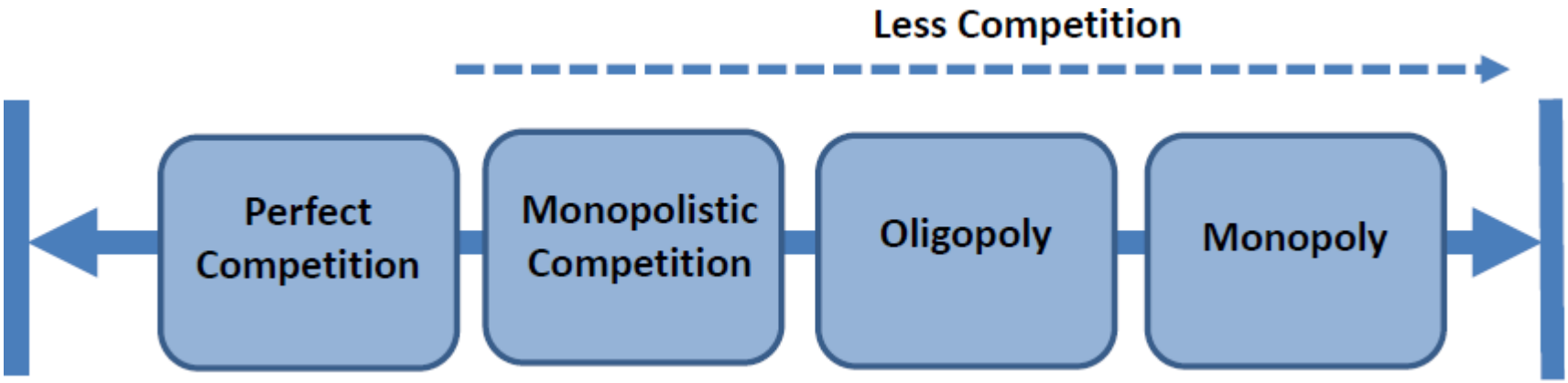
The table reveals that the price per unit is the same and TR is increasing but AR and MR remain constant. Price is equal to AR and MR (P=AR=MR) under perfect competition. The table can be shown on a diagram as given below:

UNIT-V
MARKET STRUCTURE

Structure:

1. The Market Structure Spectrum
2. Perfect Competition
3. Monopoly
4. Perfect Competition v's Monopoly
5. Monopolistic Competition
6. Oligopoly and Game Theory

1. Market Structure Spectrum

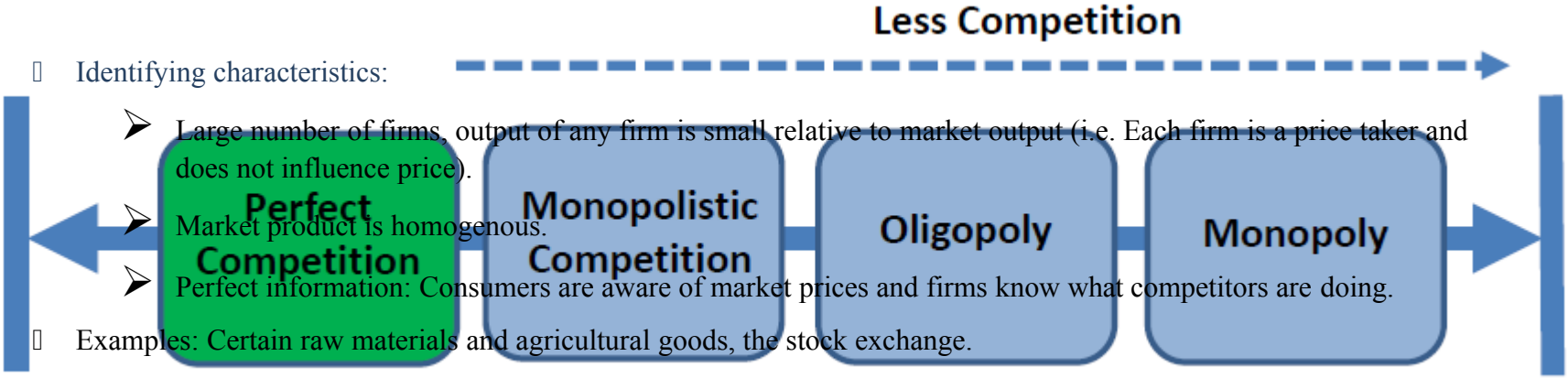


- Markets can be divided into categories depending on degrees of competition and market power.
- Market structure is a function of:
  1. No. of firms in the market.
  2. The nature of the product – differentiated (heterogeneous) or undifferentiated (homogenous).
  3. Extent of information available to market participants.
  4. Freedom of entry and exit, existence of barriers to entry.

Underlying Assumptions

Objectives of all firms is to profit maximise.

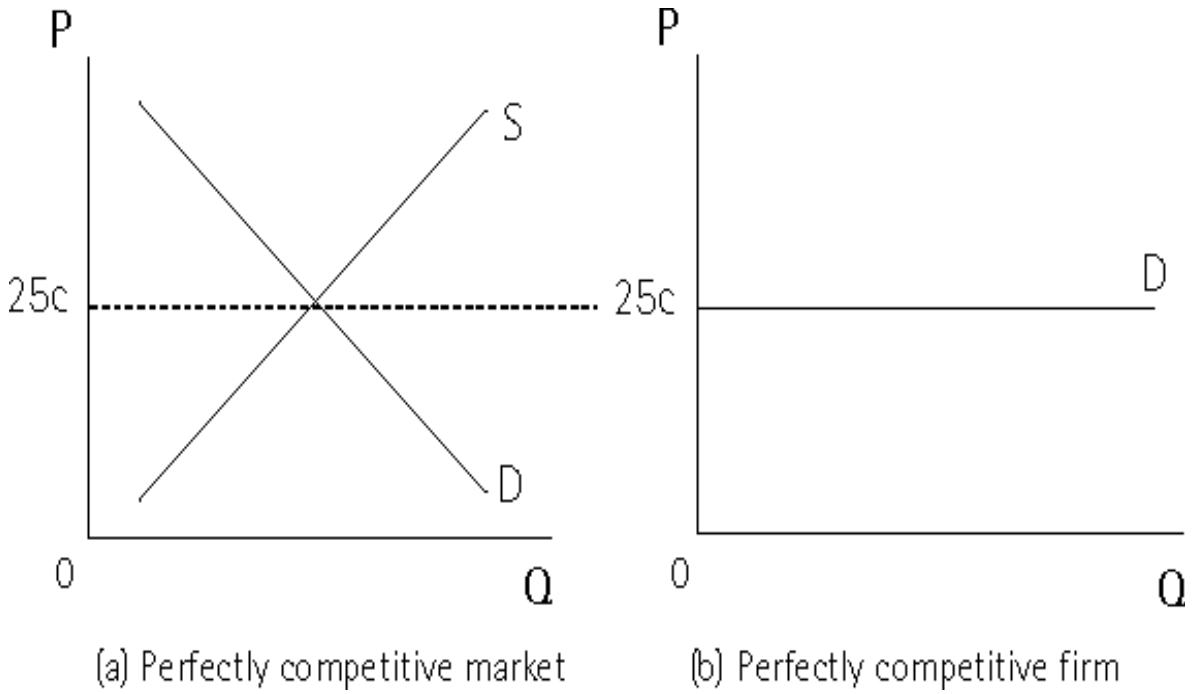
2. Perfect Competition



- Identifying characteristics:
  - Large number of firms, output of any firm is small relative to market output (i.e. Each firm is a price taker and does not influence price).
  - Market product is homogenous.
  - Perfect information: Consumers are aware of market prices and firms know what competitors are doing.
- Examples: Certain raw materials and agricultural goods, the stock exchange.

The perfectly competitive market

- The fact that firm is a price taker has import implications for the shape of the demand curve the firm faces.
- Apples on Moore street are 25c each.
  - At the market level, price is determined as normal (intersection of demand and supply)
  - Individual seller faces horizontal demand curve; can sell as much as like at 25c, will neither increase nor reduce price.

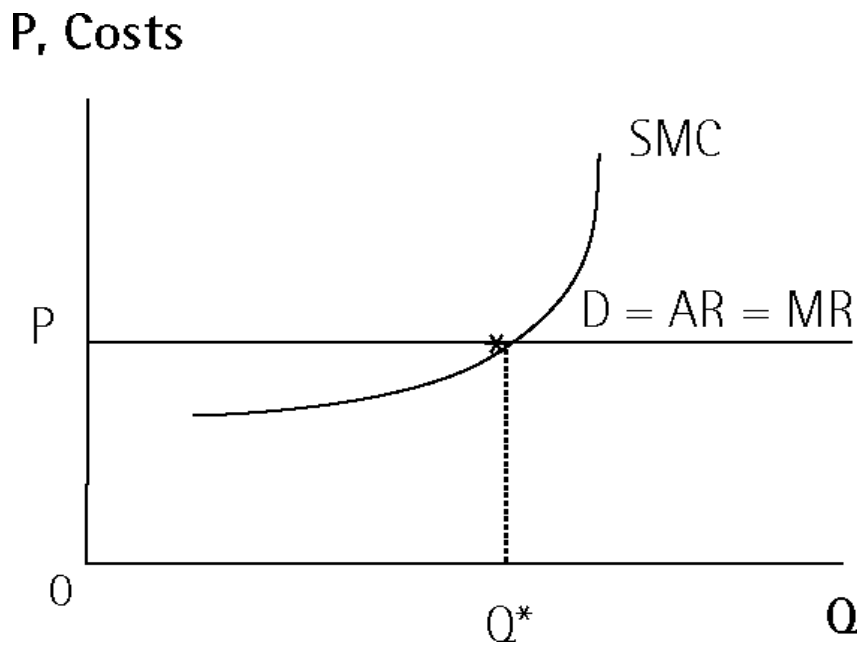


- In a perfectly competitive market marginal revenue (MR) is equal to price (P) and average revenue (AR).
- Example: Firm does not have to lower price to sell more.

Qty	Price	TR	MR	AR
0	10	-	-	-
1	10	10	10	10
2	10	20	10	10
3	10	30	10	10
4	10	40	10	10

Output Decision in the Short-run

- 1st Output Condition: Profit-maximising firm will produce/sell where MR = SMC at Q*.
- With perfect competition MR = SMC = P at Q*.
- 1st Output Condition is a necessary but not sufficient condition for producing at profit maximising level.

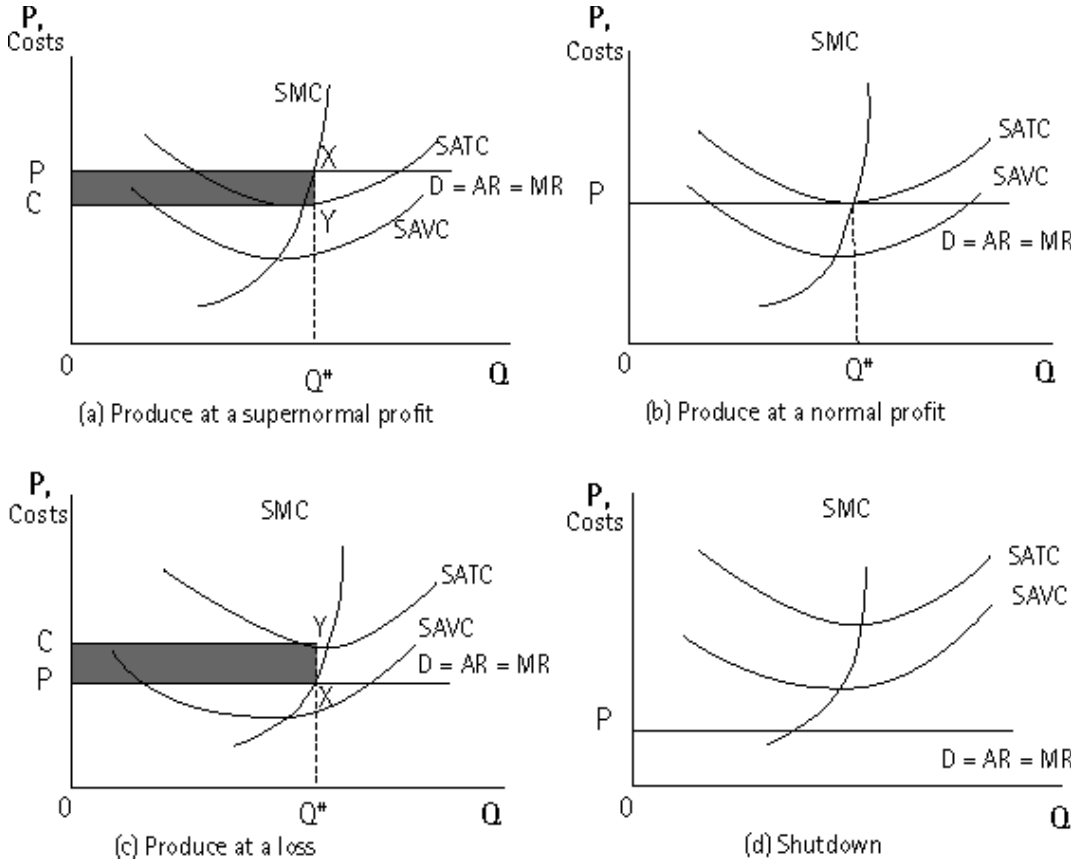


Four scenarios for a perfectly competitive firm

- 2nd Output Condition:

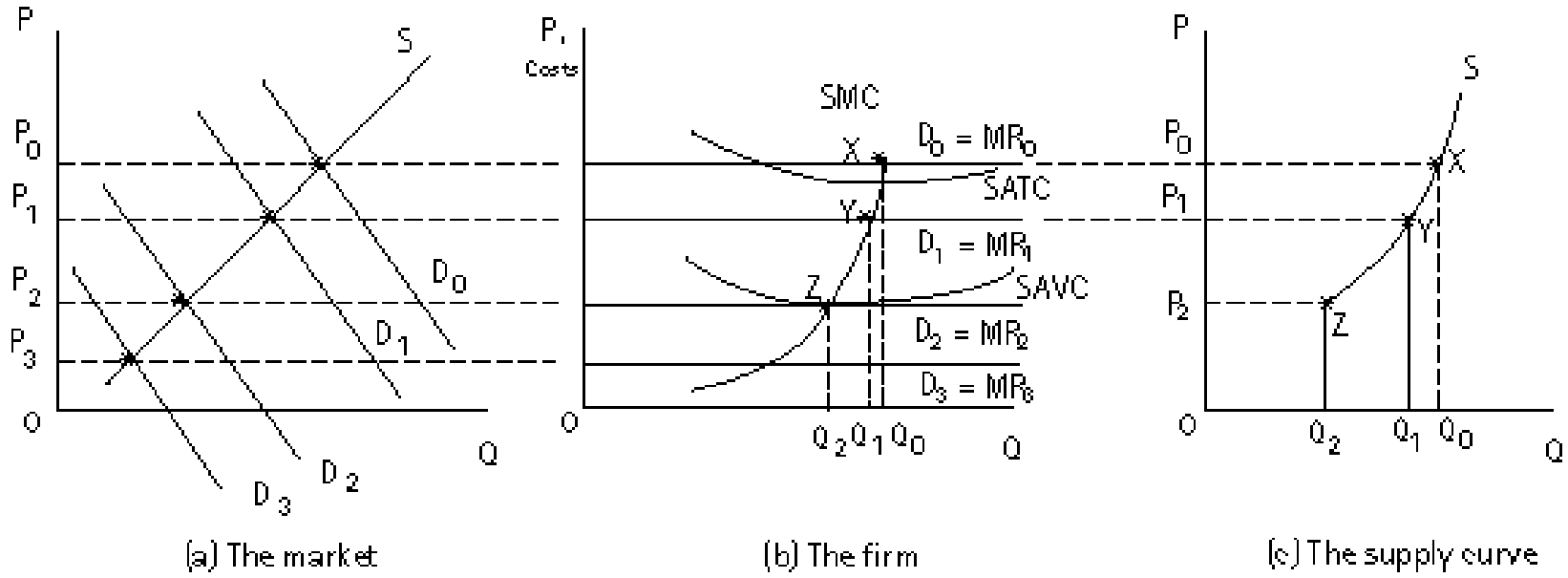
Firm must cover total costs (P≥SATC).

- (a) Since the AR curve is above the SATC, at the profit maximising level of production, the firm is making a supernormal profit.
  - ➢ |XY| is supernormal profit per unit.
  - ➢ Super normal profit is |XY|Q* or [PXQ*0] – [CYQ*0] = [PXYC]



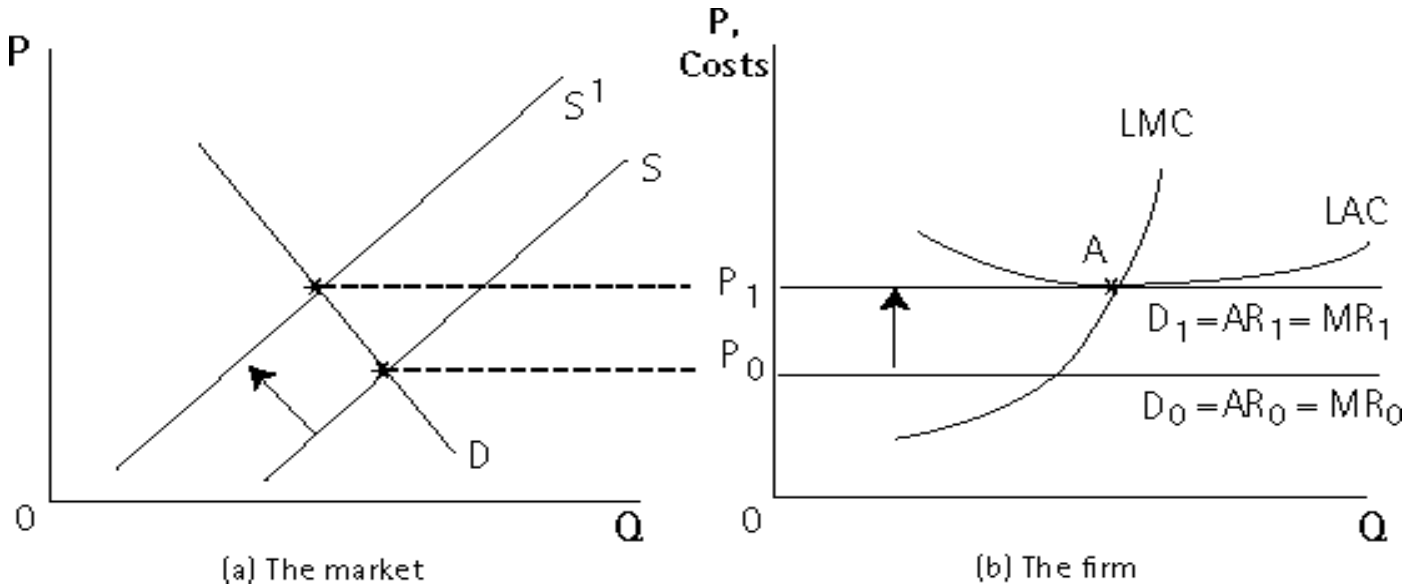
Aside: Deriving the short run supply curve in PC

- Assume a fixed SATC and SAVC in the short run.
- Start at P_0, firm will produce Q_0 (at point X) as both conditions are met at this point.
- If demand shifts inwards for whatever reason to D_1, firm will now produce Q_1 (at point Y) even though normal profits are not being achieved.
- If demand shifts inwards to D_2, the firm will produce Q_2 (at point Z), but if demand (i.e. The price) falls any further, the firm will shut down and stop supplying.
- Conclusion: Under PC, the firm's supply curve in the short-run is its marginal cost curve above the shutdown price. [Market supply curve is horizontal sum of firm supply curves]



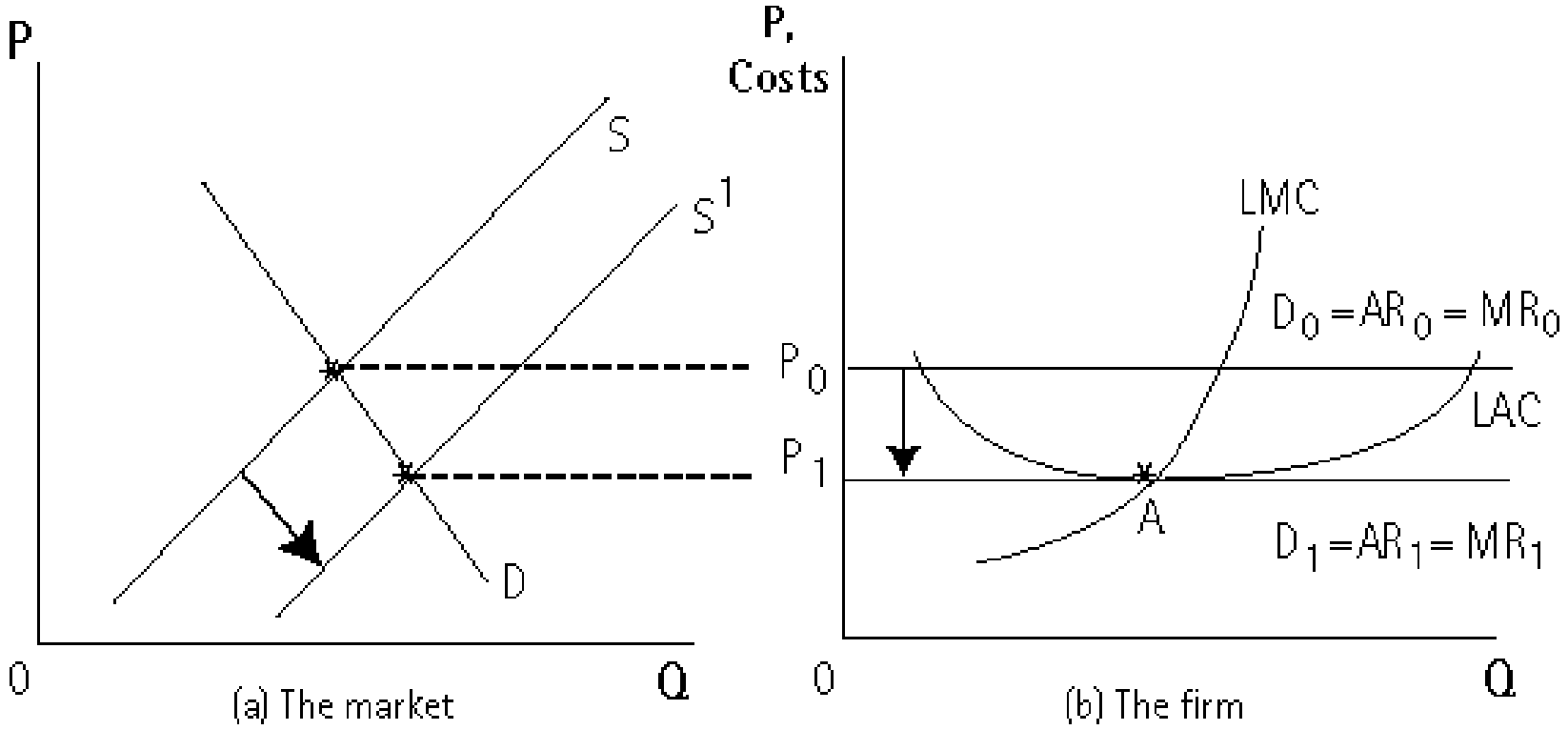
The long-run position following short-run losses

- In long-run, firms are free to enter and exit the market.
- We study two cases:
  - The long run following short-run losses.
  - The long-run following short run supernormal profits.
- Case 1: In a PC market in the long-run, firms making losses will exit the market.
  - The supply curve shifts up to the left and price rises, and continues to rise until equilibrium is attained.
  - The AR curve shifts upwards until it reaches tangency with the LAC.
  - In the long-run, remaining firms will earn only a normal profit.
  - Of course alternative approach would be to reduce costs.



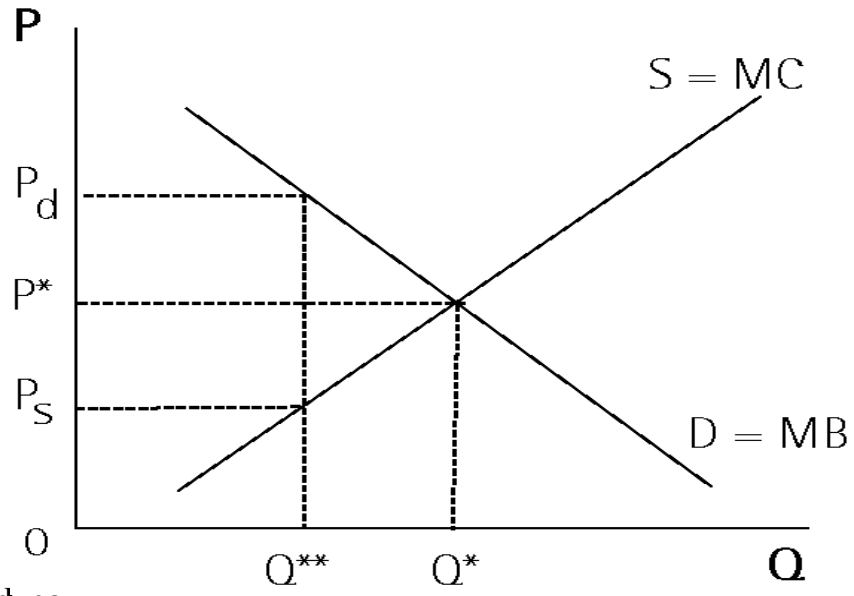
The long-run position following short-run profits

- Case 2: In a PC market in the long-run, if firms making supernormal profits, new firms will enter the market.
  - Supernormal profits will be made at P_0.
  - As firms enter the market, supply shifts outwards to S_1 and price will fall.
  - Prices will be 'competed away' until equilibrium is reached and only normal profits are made.

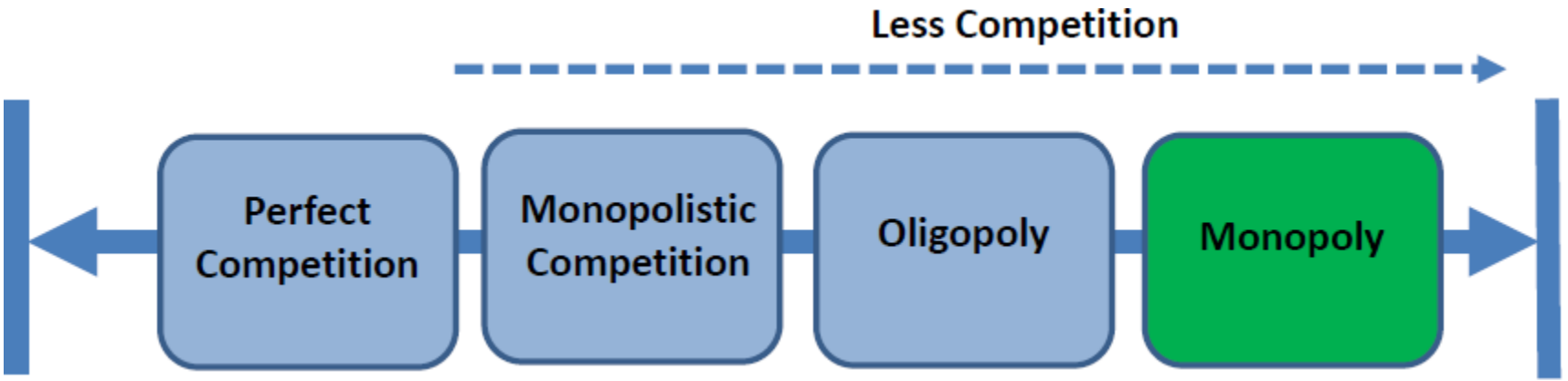


Perfectly competitive markets and efficiency

- Diagram shows the long-run equilibrium in a perfectly competitive market
- Supply curve = aggregation of marginal cost curves of all individual firms.
- Q** is not efficient nor socially optimal as customers are willing to pay the marginal cost for an additional unit. Both consumers and producers will be better off until Q*.
- At Q*:
  - Firm is making optimal use of resources since it is producing at least possible cost per unit of output. Firm is producing in most efficient manner.
  - Consumer not will in pay more for additional unit.
  - Socially optimal, pareto efficient outcome.



3. Monopoly


Less Competition
Perfect Competition
Monopolistic Competition
Oligopoly
Monopoly

Forms of Monopoly

- Natural monopoly (economies of scale)
  - utility companies, e.g. electricity (transmission), natural gas, cable or rail network, household waste collection
- Statutory monopoly
  - a patent; e.g. a new drug
  - sole ownership of a resource; e.g. a toll bridge
- Artificial monopoly, e.g. explicit formation of a cartel, e.g. OPEC

Monopoly Characteristics

1. Only one firm (seller) in the market.
2. A unique product is sold.
3. Barriers to entry exist which preclude the possibility of new firms entering the market even if monopolist is making supernormal profits.
4. Two types: Single priced and price discriminating monopolist

- Discussion: Examples of monopolies

Type	Description	Low barrier	High barrier
Type of asset	Specific assets have more value in their current use than in the next best alternative. General assets can be shifted to alternative activities.	general	specific
Excess capacity	Incumbents are able to produce more output at an equal or lower price. Can be caused by cyclical demand or adopted as a strategy to deter new entrants.	insignificant excess capacity	substantial excess capacity
Reputational effects	Based on history of retaliation against new entrants and/or the resources available to incumbents to retaliate.	no retaliation anticipated	retaliation expected
Precommitment contracts	Long term contracts: with suppliers to purchase input at favourable rates; with distributors to give the product a favourable location; and with consumers to provide and maintain their product.	none or few	extensive
Pioneering brand advantage	Consumer loyalty given to first entrant into market.	quality of product can be judged prior to purchase	product must be purchased before testing
Cost of entry	Set-up costs required for a firm to enter a market.	low	high

Barriers to Entry 2

Type	Description	Low barrier	High barrier
Economies of scale	Minimum viable scale is the minimum amount of output required to produce a product at a cost that is very close to the competitors' cost per unit.	MVS at low % of industry output	MVS at high % of industry output
Government regulations	Licensing agreements are required before a firm can enter some markets. Patents legally restrict firms from copying an innovation for 17 years. Other regulations are designed to ensure product quality and/or consumer safety.	unregulated	regulated
Learning curve effects	Incumbents operating in a market benefit from knowledge which allows them to produce at a lower cost per unit.	small cost advantage	large cost advantage
Cost of exit	Exit barriers are factors that keep firms competing in a market. Sources of barriers include labour agreements, government intervention and emotional attachment to a market, location or employees.	low	high

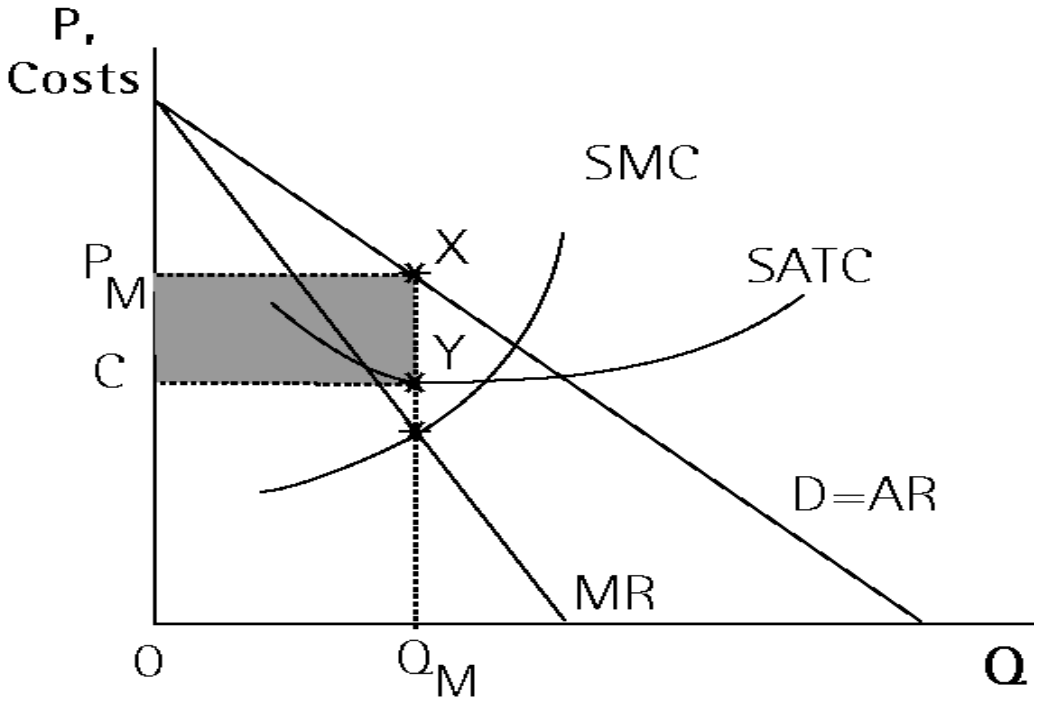
Single Priced: Monopoly equilibrium

- Single priced monopolist: All the monopoly's customers are charged the same price.
- Since the monopolist is the only firm in market, the demand curve it faces is the market demand curve.
- As the demand curve is downward sloping, MR is less than price.
- Example in table:
  - At P = €8, the monopolist sells two units, collecting total revenues of €16. Total revenue increases to €21 when €7 is charged. MR fell to €5 as to sell 3 units the price of all units sold had to be reduced.
  - MR is always less than price when demand curve is downward slowing.

Qty	Price	TR	MR	AR
0	10	-	-	-
1	9	9	9	9
2	8	16	7	8
3	7	21	5	7
4	6	24	3	6

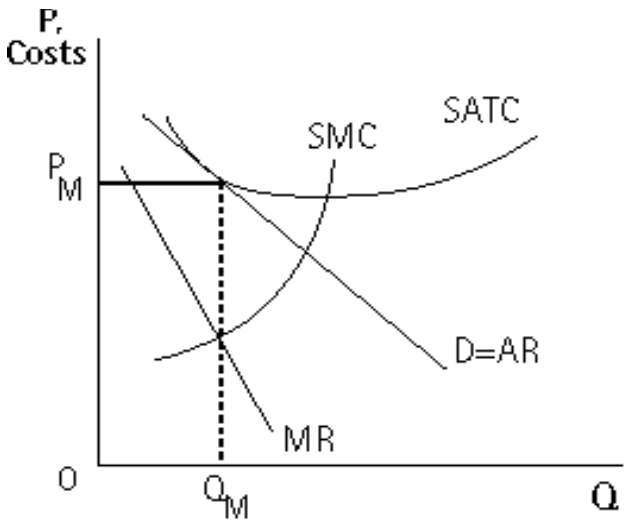
SPM: Short-run equilibrium

- 1st condition (marginal) is met at output level Qm.
- 2nd condition (P>SATC)
- |XY| is supernormal profit per unit (difference between price and SATC)
- Total profit is [PmXYC]
- Supernormal profits can be sustained in the long-run for the monopolist. [Less distinction between short and long run]
- However, no guarantee that monopolist will earn supernormal profits.

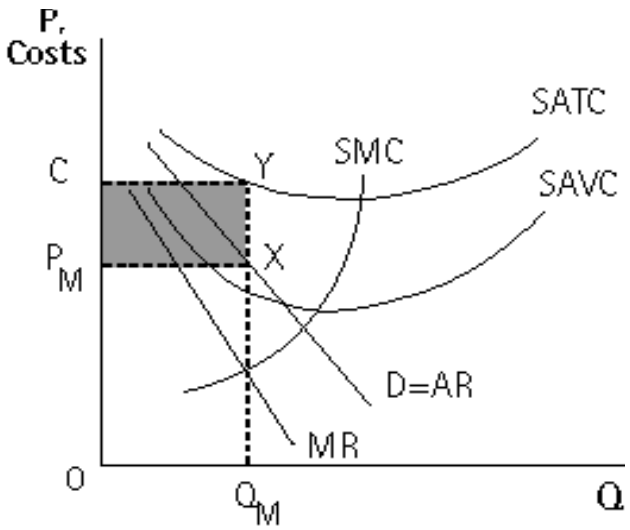


Monopolist earning a normal profit; sustaining a loss

- However, no guarantee that monopolist will earn supernormal profits.
- For a given level of demand, it depends on the structure of costs.
- Or maybe price is kept artificially low by a regulator.
- (a) at Qm the average revenue curve is tangent to the average total cost curve and so a normal profit is achieved.
- (b) Monopolist will produce at a loss as price is greater than SAVC but lower than SATC. We expect monopolist to exit market if not making a normal profit in the long-run, unless state subsidised.



(a) Monopolist earning a normal profit



(b) Monopolist sustaining a loss

Price Discrimination

- *Price discrimination occurs when a firm charges different prices to different consumers for the same product for reasons other than differences in costs.*
- Price discriminating monopolist earns more profit than a single priced monopolist.
- Two conditions:
  - Separate markets featuring demand curves with different price elasticities must be identified. Separate markets by classification of customer, geography or time.
  - The markets must be separated so that the products can not be resold.
- *First degree price discrimination occurs when every consumer is* charged the maximum price that he/she is willing to pay.
- Third degree price discrimination occurs when a firm separates consumers into a small number of classes and establishes a different price for each class.
- Discussion: Any examples?

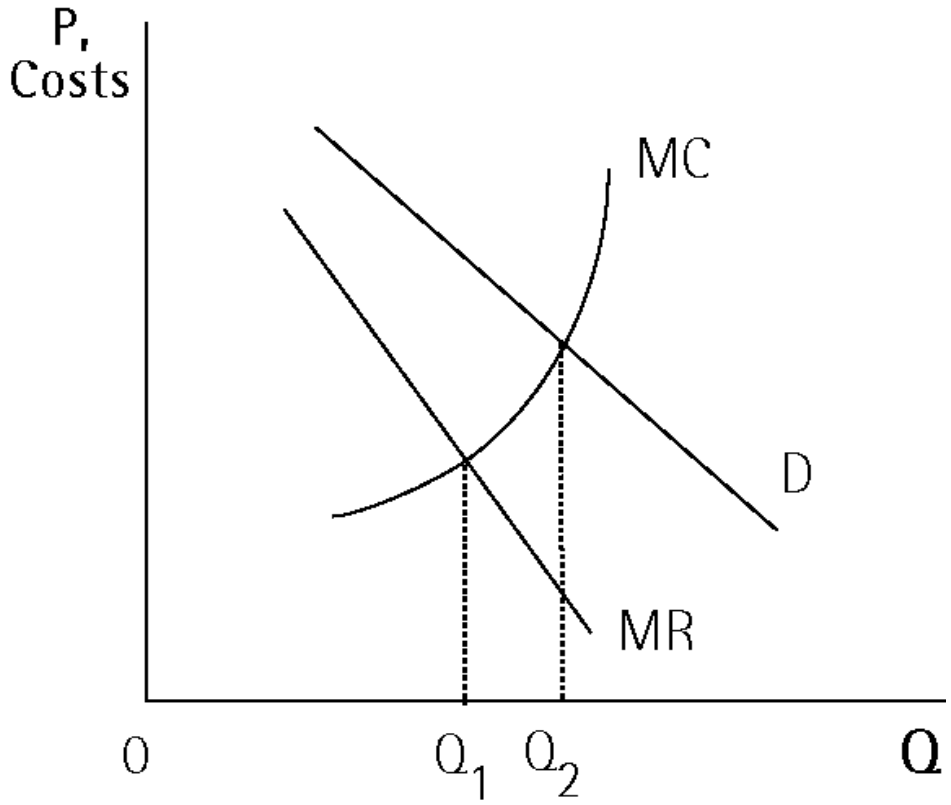
Price Discriminating Monopolist

- Only difference from single priced monopolist example is that the producer does not have to cut price on previous units sold.
- MR per unit sold is higher in this case. TR is also higher.
- The demand curve, price and marginal revenue are the same in this case.

Qty	Price	TR	MR
0	10	-	-
1	9	9	9
2	8	17	8
3	7	24	7
4	6	30	6

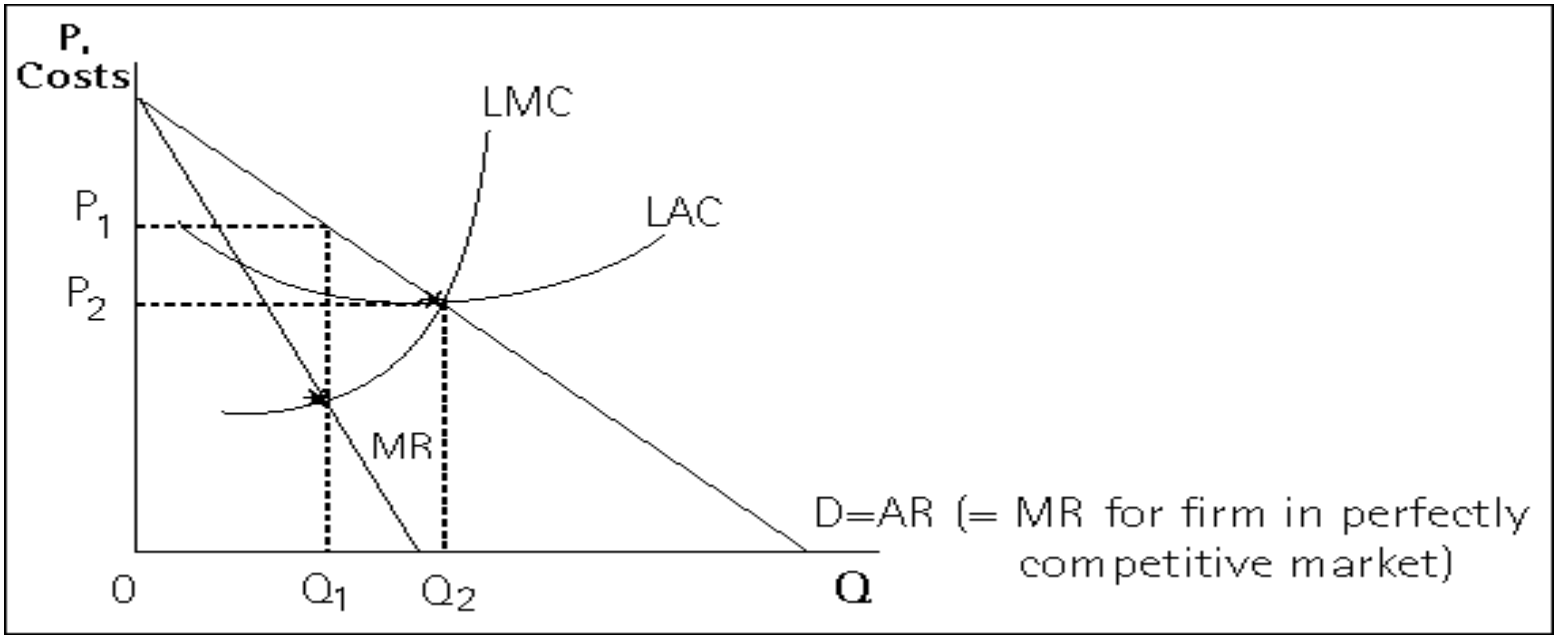
Profit-maximising levels of output for the single- price monopolist and the price discriminating monopolist

- Single price monopolist will produce at Q_1
- First degree price discriminating monopolist will produce at Q_2



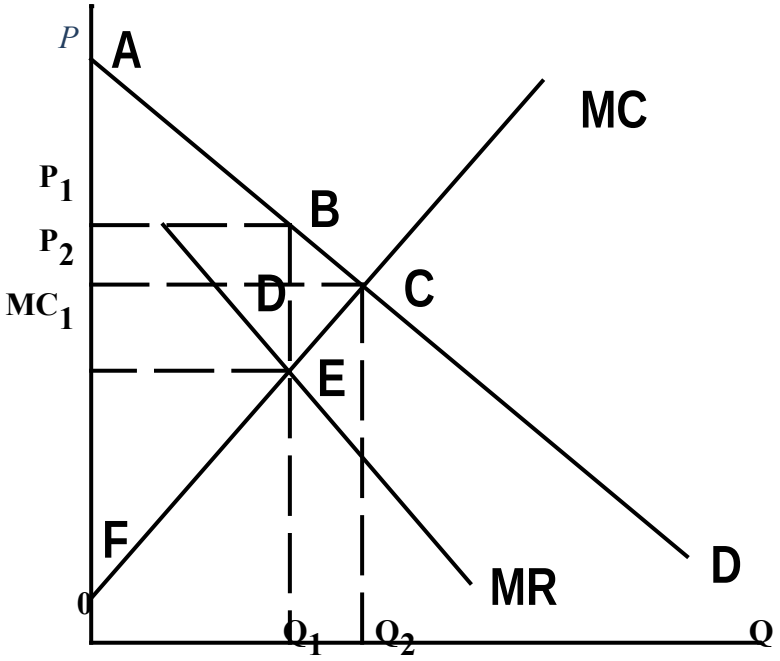
Perfect competition and single price monopoly compared

- Compare equilibrium positions
- To do this, join (hypothetically) all firms in perfectly competitive market together to hypothetically create one firm.
- Long-run PC: MR = MC = AC = AR ⇒ Q_2 produced at price P_2.
- Long-run SPM: MR = MC ⇒ Q_1 produced at P_1.
- SPM is producing less and charging a higher price, this can persist in long-run.



Monopoly equilibrium and efficiency

- Single priced monopolist
- At market equilibrium, the additional cost of producing an extra unit of output (MC_1) is less than what consumers are willing to pay for an extra unit (P_1) .
- Increasing production beyond Q_1 adds more to consumer welfare than to producers cost.
- Area BCE is the net gain to society from increasing output from the monopoly level that would occur in a perfectly competitive market. But what about distributional effects?



Consumer Surplus in Action

- ***Consumer surplus is the amount a buyer is willing to pay for a product minus the amount the buyer actually pays.***
- Consumer surplus is the area below the demand curve and above the market price.
  - A lower market price will increase consumer surplus (provided that the product is still supplied, of course).
  - A higher market price will reduce consumer surplus.

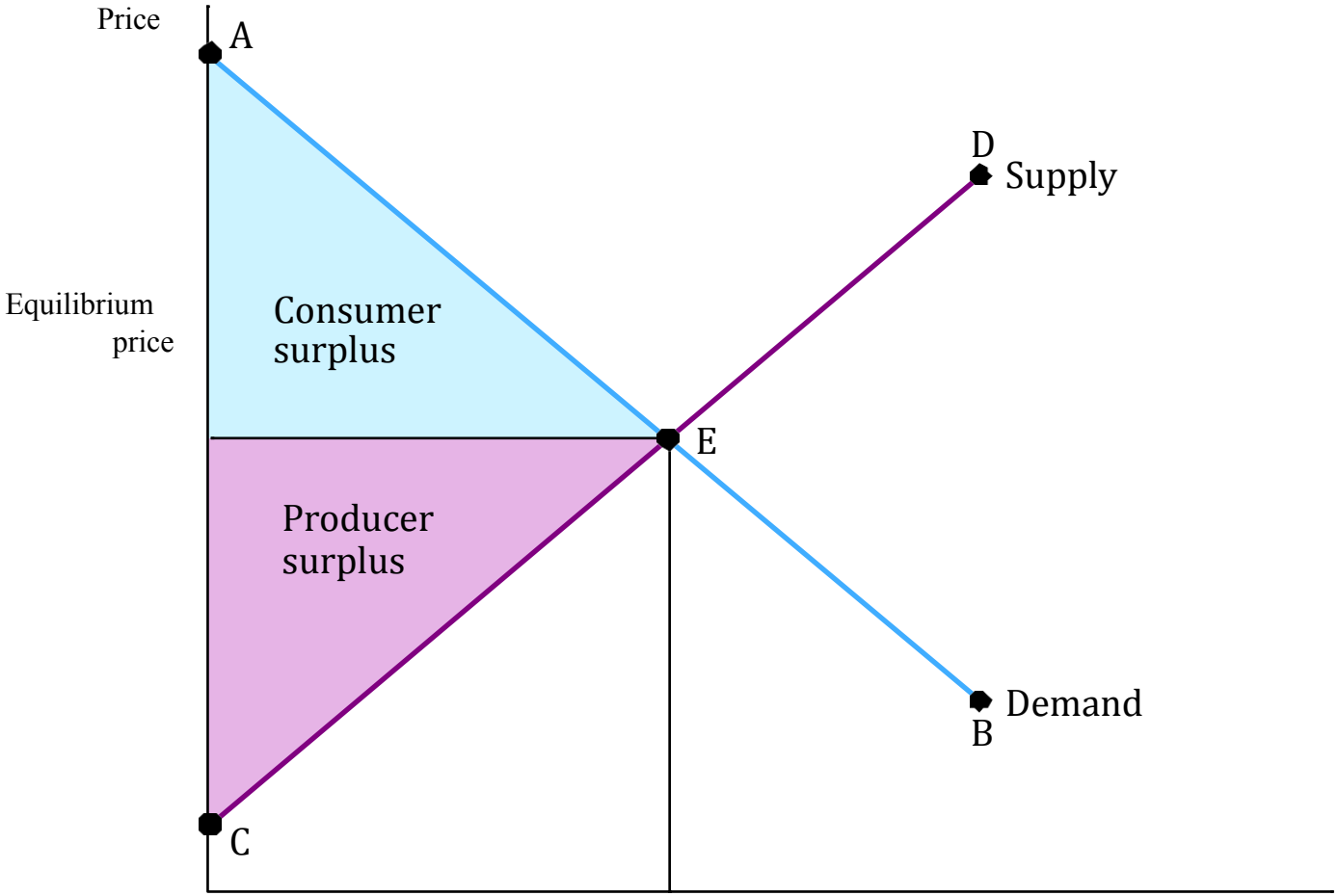
Producer Surplus in Action

- Producer surplus is the amount a seller is paid for a product minus the total variable cost of production.
  - A higher market price will increase producer surplus (provided that the product is still demanded, of course).
  - A lower market price will decrease producer surplus.

Economic Welfare

- Economic welfare is (generally) quantified as the sum of consumer surplus and producer surplus, i.e. equal weights are generally assumed.
- Alternative relative weights are also possible.

Consumer Surplus and Producer Surplus: Market Equilibrium



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EC8005b Understanding Markets

Equilibrium quantity

Quantity

Monopoly equilibrium and efficiency

- Distributional Effects
- Consumer surplus: amount consumers

willing to pay over and above what consumers actually have to pay.

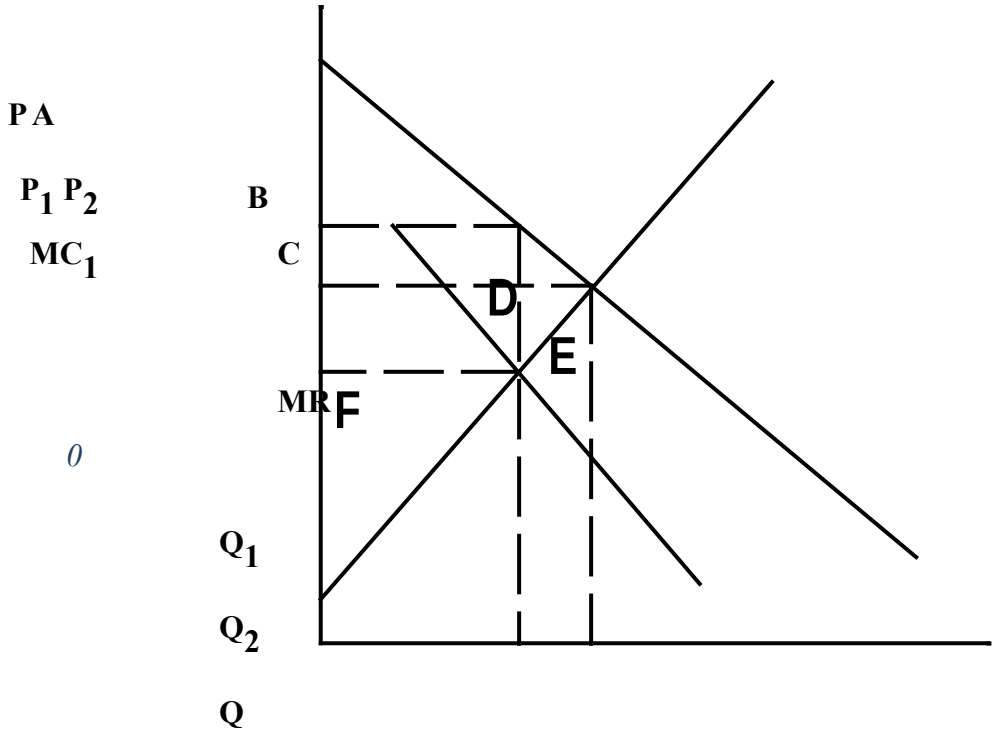
- PC: Triangle ACP_2
- SPM = ABP_1
- Part of loss goes to monopolist P_1BDP_2
- Rest is a loss to both (society) of BCD.

- Producer surplus:

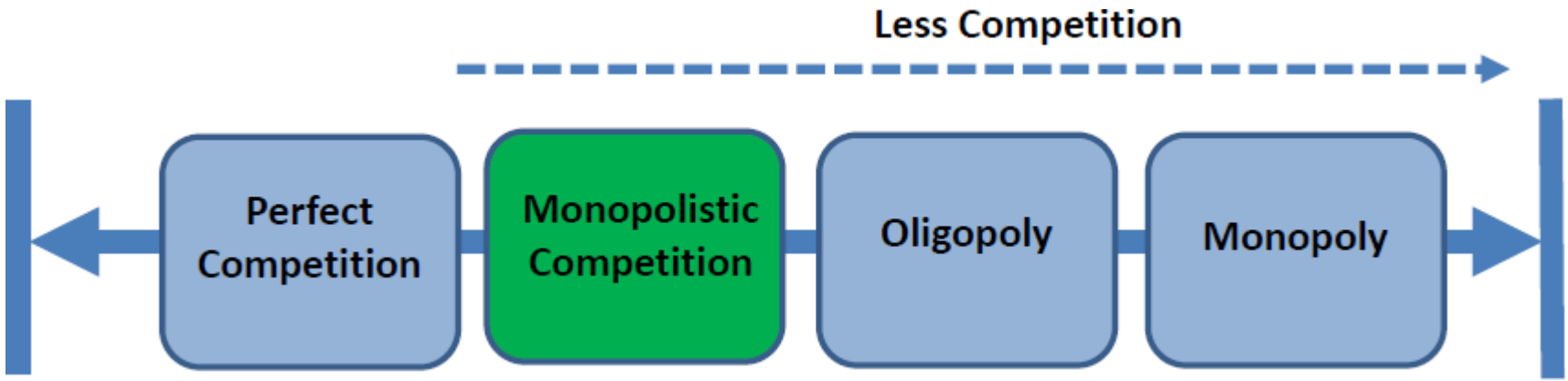
  Amount that producers receive over and above the minimum amount necessary to keep them in the market.

  - PC: Triangle CFP_2
  - SPM: P_1BEF
  - DCE is lost PS not appropriated by consumers.

- Total loss to society is BCE (DCE + BCD).



4. Monopolistic Competition

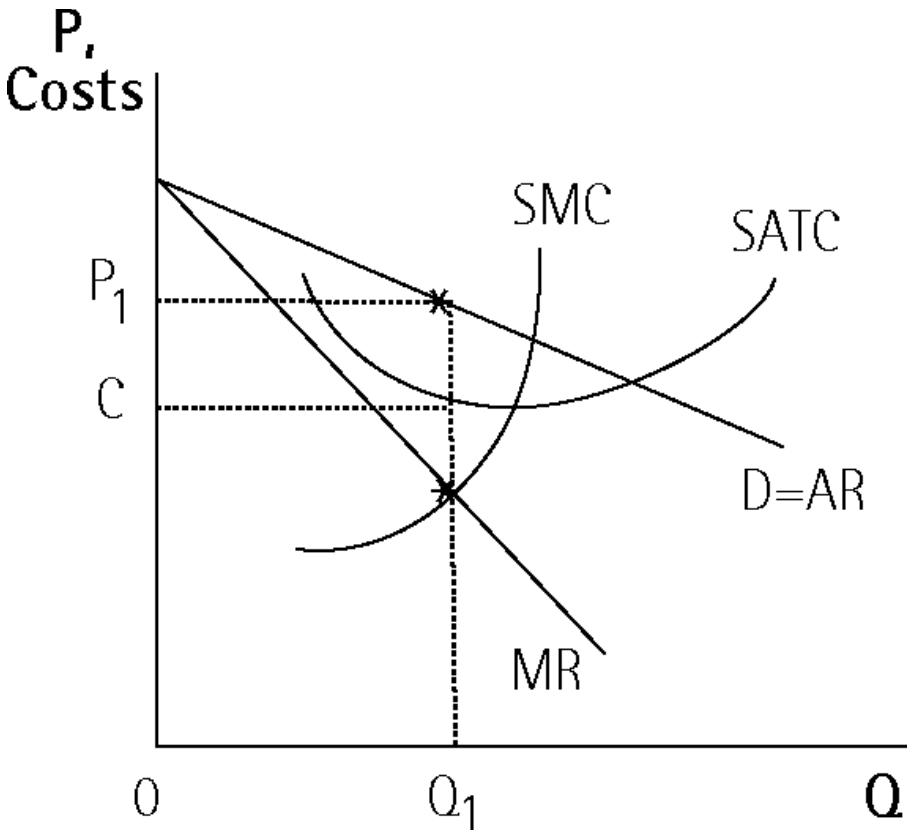


Monopolistic Competition

- ***Incorporates features of both PC and monopoly.***
  - Large number of firms
  - Freedom to enter and exit
  - But products are differenced. Close but nor perfect substitutes.
- Means that in short-run firms have some degree of market power (with own brands/products) resulting in the possibility of supernormal profits.
- Demand curve is downward sloping but more elastic (flatter) than that of a monopolist.

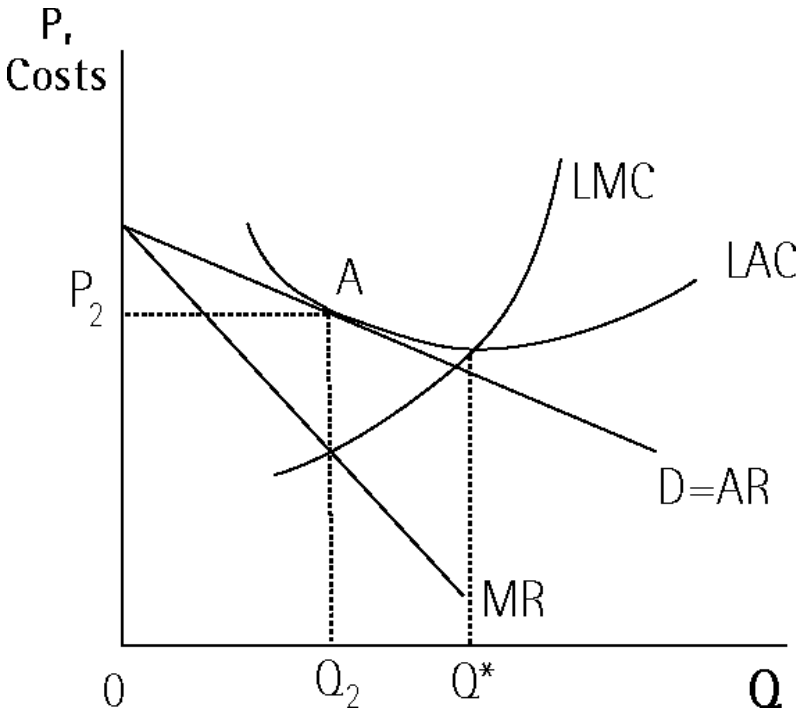
A monopolistic competitor's short-run equilibrium

- 1st condition: Monopolistic Competitor will produce at Q_1 where MC = MR.
- In this case AR is greater than SATC so supernormal profits are earned.
- This wont last in the long-run.

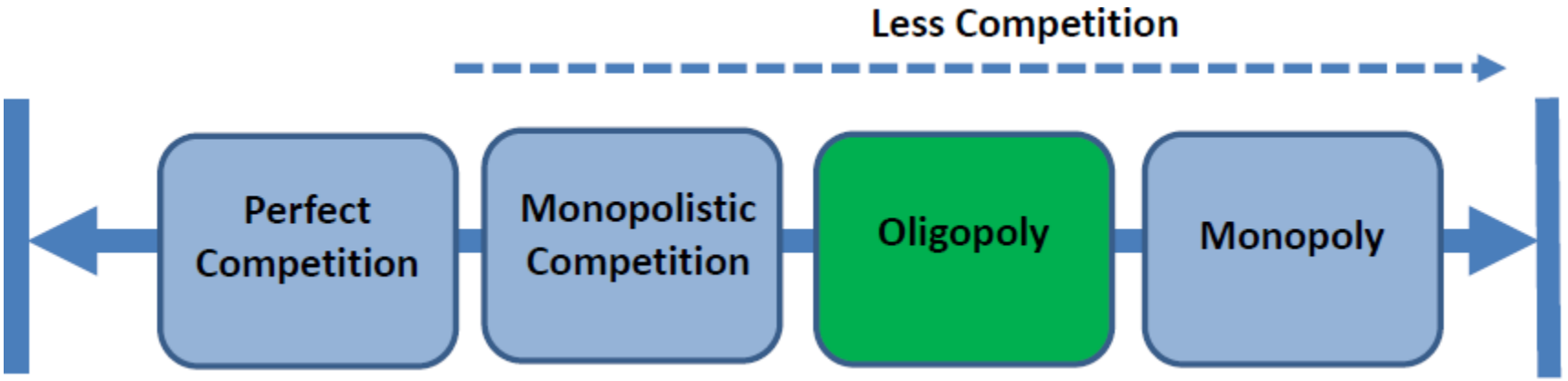


A monopolistic competitor's long-run equilibrium

- Because of free entry, new firms will be attracted into the market and produce very close substitutes.
- Market supply rises and prices fall. Demand for existing firm's product falls as its market share falls – demand curve becomes more elastic (flatter).
- Supernormal profits are 'competed away' until no further incentive for firms to enter market.
- Long-run equilibrium is achieved at point A (Q2), also where MR = MC and AR = LAC.
- MC does not produce at the lowest point on its average cost curve. Not socially optimal.
- Additional costs like advertising and branding part explain these inefficiencies.
- But we do gain variety (innovation) at the expense of efficiency.



5. Oligopoly


Less Competition
Perfect Competition
Monopolistic Competition
Oligopoly
Monopoly

1. **Assumptions**
2. Collusive Oligopoly
3. Game Theory: Prisoners Dilemma
4. Advertising Game
5. Eating Out Game

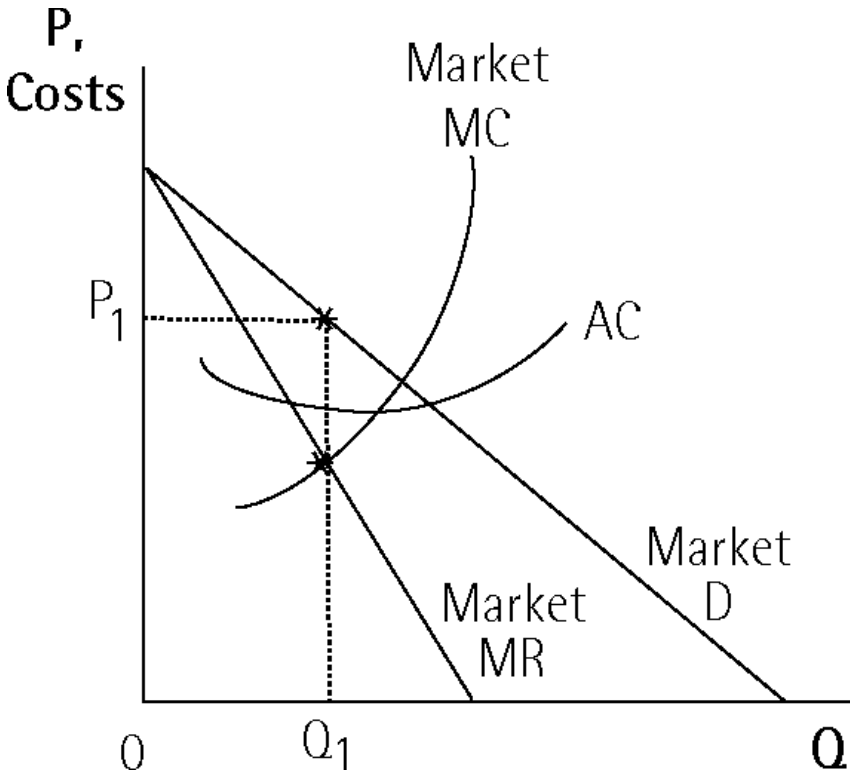
Oligopoly: Assumptions

1. ***Many buyers***
2. Small number of major sellers (interdependence: actions and reactions are very important)
3. Homogeneous product (usually, but not necessarily). Oil (identical) v's cars (differentiated).
4. Complete information (usually, but not necessarily)
5. Restricted entry (usually, but not necessarily)

- Under oligopoly, prices tend to be higher.
- If there is full collusion, firms can act as a monopoly.
- There is no single theory of oligopolistic behaviour.

Collusive oligopoly

- Act as a monopolist when firms get together and collude over price and output strategies.
- Equilibrium position is identical to monopoly model.
- Total market demand is shared out between firms through a quota (e.g. OPEC).
- A cartel is a group of firms who collude on price and output decisions in an effort to earn monopoly profits.
- Cartels are outlawed in most countries but difficult to police.
- Incentive to cheat if in a cartel.



1. The unpredictable nature of colluding firms led to the focus on game theory to help understand oligopolistic behaviour.
2. Game theory has many applications.
3. A game consists of rules, players (decision makers), strategies (actions) and payoffs (scores).
4. Players try to maximise his/her own payoff.

Prisoners Dilemma

- Two suspected thieves are apprehended by the police.
- The Sergeant places the two suspects into different rooms.
- Told if both confess – joint sentence = 4 years.
- If neither confess – joint sentence = 1 year.
- If one confesses and the other does not – confessors sentence quashed, while accomplice will receive 8 years.
- Neither suspect knows what the others decision will be.
- Each suspect will take

Prisoners Dilemma Pay-offs

		Suspect 2	
		Confess	**Deny**
Suspect 1	**Confess**	**4,4**	**0,8**
	Deny	**8,0**	**1,1**

- Suspects will choose dominant strategies.
- Both suspects confess and hence the Nash equilibrium is {confess, confess}.

Examples of Games: Advertising Game (≈ Prisoners' Dilemma)

		Firm j	
		Advertise	**Don't Advertise**
Firm i	**Advertise**	**2,2**	**4,1**
	Don't Advertise	**1,4**	**3,3**

Advertising Game

- Nash equilibrium = Advertise, Advertise = [2,2]
- [2,2] < [3,3] i.e. Nash equilibrium can be inefficient!
- Cooperation may evolve in repeated games.

Oligopoly: Collude or Cheat?

		Firm 2	
		Maintain high p	**Undercut**
Firm 1	**Maintain high P**	**7,7**	**1,10**
	Undercut	**10,1**	**2,2**

Summary

TABLE 6.10: THE CHARACTERISTIC DIFFERENCES BETWEEN MARKET STRUCTURES

	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
No. of firms	Many	Many	Few	One
Type of product	Identical	Differentiated	Identical or differentiated	Unique
Barriers to entry	No	No	Yes/No	Yes
Pricing strategy	Price taker	Price maker	Interdependent	Price maker
Long-run profits	Normal	Normal	Possibility of Supernormal	Possibility of Supernormal
Examples	Agricultural markets Capital markets	Service stations Restaurants	Automobile fuel Cement	Rail-transport Airport management

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EC8005b Understanding