

Economic management

Unit -1

What Is Economics?

Economics is a social science concerned with the production, distribution, and consumption of goods and services. It studies how individuals, businesses, governments, and nations make choices on allocating resources to satisfy their wants and needs, trying to determine how these groups should organize and coordinate efforts to achieve maximum output.

Types of Economics

The study of economics is generally broken down into two disciplines.

- Microeconomics focuses on how individual consumers and firm make decisions; these individuals can be a single person, a household, a business/organization or a government agency. Analyzing certain aspects of human behavior, microeconomics tries to explain they respond to changes in price and why they demand what they do at particular price levels. Microeconomics tries to explain how and why different goods are valued differently, how individuals make financial decisions, and how individuals best trade, coordinate and cooperate with one another. Microeconomics' topics range from the dynamics of supply and demand to the efficiency and costs associated with producing goods and services; they also include how labor is divided and allocated, uncertainty, [risk](#), and strategic [game theory](#).
- Macroeconomics studies an overall economy on both a national and international level. Its focus can include a distinct geographical region, a country, a continent, or even the whole world. Topics studied include foreign trade, government fiscal and monetary policy, unemployment rates, the level of inflation and interest rates, the growth of total production output as reflected by changes in the Gross Domestic Product (GDP), and [business cycles](#) that result in expansions, booms, recessions, and depressions.

Micro- and macroeconomics are intertwined; as economists gain an understanding of certain phenomena, they can help us make more informed decisions when allocating resources. Many believe that microeconomics' foundations of individuals and firms acting in aggregate constitute macroeconomic phenomena.

What Does Production Possibilities Frontier Mean?

What is the definition of production possibilities frontier? The production possibility frontier indicates the maximum production possibilities of two goods or services, assuming a fixed level of technology and only one choice between the two.

Producing one good always creates a trade off over producing another good. In other words, if more of good A is produced, less of good B can be produced given the resources and production technology remain constant.

Hence, the production of one good or service increases when the production of the other good or service decreases. The PPF measures the efficiency in which the two goods or services are produced together. In that way, it helps managers to determine the most beneficial mix of commodities for the business.

Let's look at an example.

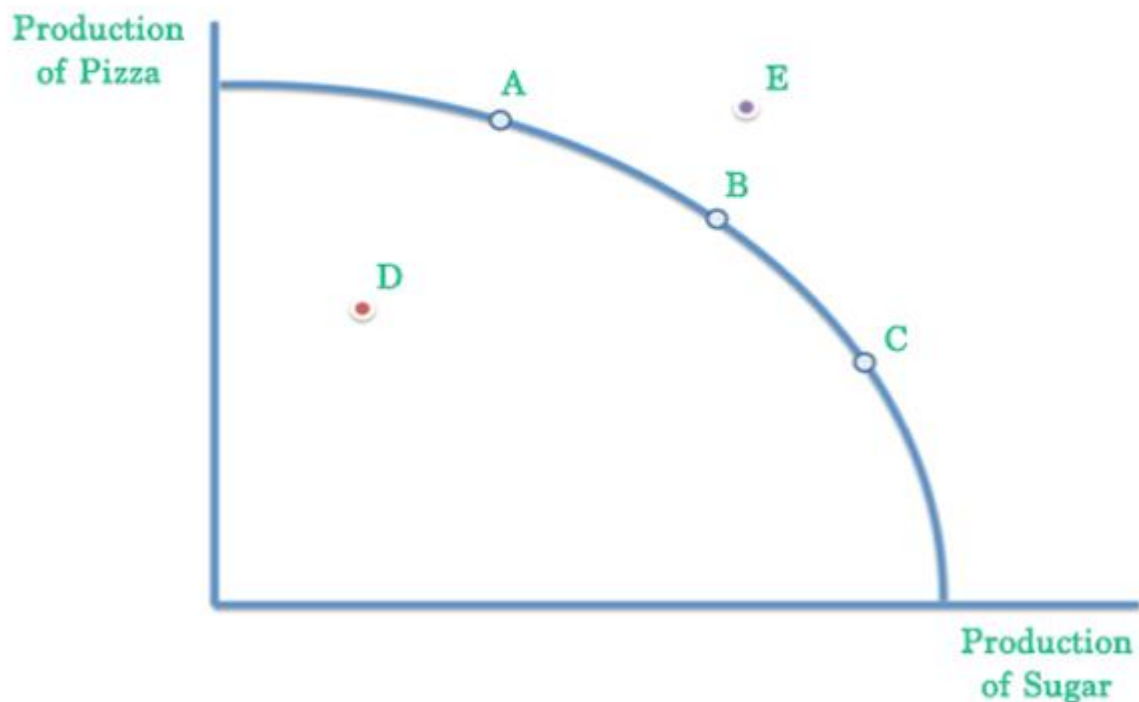
Example

Typically, opportunity cost occurs when a manager chooses between two alternative ways of allocating business resources. In other words, if one action is chosen, the other action is foregone or given up. There is a trade off. Hence, the production possibility frontier provides an accurate tool to illustrate the effects of making an economic choice.

At any given point of a PPF, the company produces at maximum efficiency by fully using its resources. At an economic level, this is known as the Pareto efficiency, which suggests that, when allocating resources, the choice of one will worsen the other. Also, any point inside the PPF is inefficient because at that point the output is greater than the output that the existing resources can produce.

For example, a country produces pizza and sugar. If the country decides to ramp up its sugar production, using the existing fixed resources, it has to lower its pizza production. Hence, at points A, B, and C, the economy achieves the maximum production possibilities between pizza and sugar. Point D is inside the PPF line and is inefficient because all the resources are not being used properly. Point E is simply beyond the amount of production attainable with the current level of resources.

Production Possibilities Frontier (PPF)



Summary Definition

Define Production Possibilities Frontier: PPF means a graphical representation of the possible production combinations a company could produce if it used all of its resources to produce only two goods or services.

Unit-2

consumer's equilibrium: assumptions and conditions:

A consumer is in equilibrium when given his tastes, and price of the two goods, he spends a given money income on the purchase of two goods in such a way as to get the maximum satisfaction, According to Koulsayiannis, "The consumer is in equilibrium when he maximises his utility, given his income and the market prices."

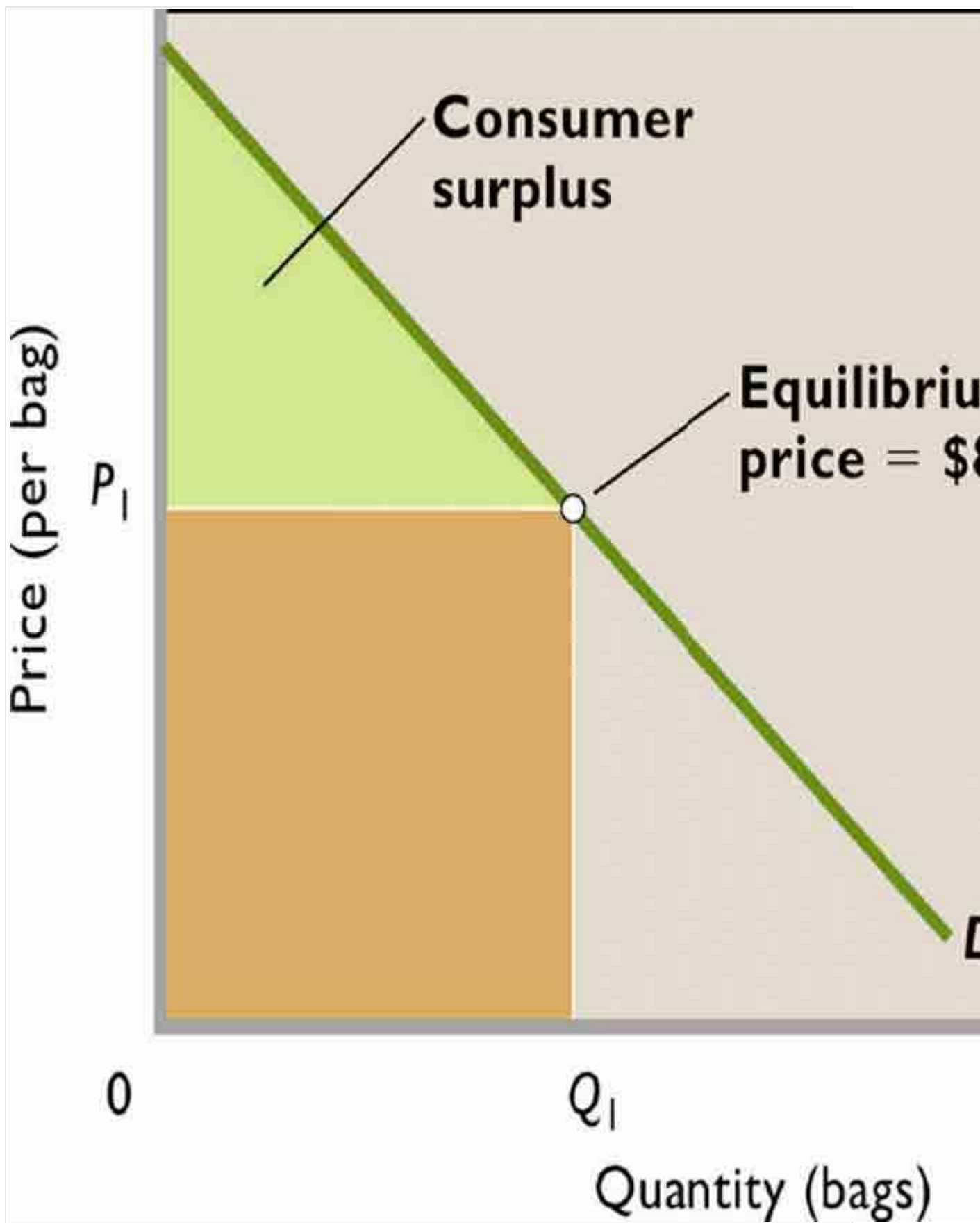


Image Courtesy : harpercollege.edu/mhealy/ecogif/s%26d/fig17-6.5.gif

Its Assumptions:

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The indifference curve analysis of consumer's equilibrium is based on the following assumptions:

(1) The consumer's indifference map for the two goods X and Y is based on his scale of preferences for them which does not change at all in this analysis.

(2) His money income is given and constant. It is Rs. 10 which he spends on the two goods in question.

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(3) Prices of the two goods X and Y are also given and constant. X is priced at Rs. 2 per unit and Y at Rs. 1 per unit.

(4) The goods X and Y are homogeneous and divisible.

(5) There is no change in the tastes and habits of the consumer throughout the analysis

(6) There is perfect competition in the market from where he makes his purchases of the two goods.

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(7) The consumer is rational and thus maximises his satisfaction from the purchase of the two goods.

Its Conditions:

There are three conditions for consumer's equilibrium:

(1) The Budget line should be Tangent to the Indifference Curve. Given these assumptions, the consumer can buy 5 units of X by spending the entire sum of Rs. 10 on good X or on 10 units of Y. Table 12.3 illustrates some of the possible combinations on which Rs. 10 can be allocated.

TABLE 12.3 EXPENDITURE PLAN

Combination	Good X (units)	Good Y (units)
Q	5	0
N	4	2
T	3	4
S	2½	5
K	1½	7
R	1	8
P	0	10

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Fig. 12.12 shows these seven possible combinations indicated by points P, R, K, S, T, N and Q. The line PQ shows combinations of goods X and Y, given their prices, when he spends his income on them. This is because, algebraically $I = P_x X + P_y Y$, where I represents the consumer's income, P_x and P_y the prices of goods X and Y, respectively.

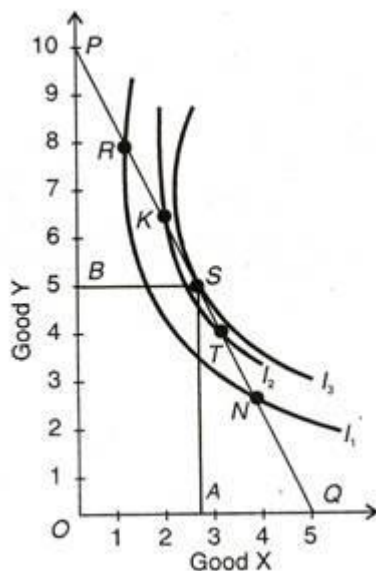


Fig. 12.12

This budget equation is the equation of the line connecting the points Q and P, where $Q = I/P_x$ and $P = I/P_y$. Thus PQ is the budget line.

On this budget line, the consumer can have any combination, out of the possible seven combinations P, R, K, S, T, N, or Q. Combination P or Q is out of question for in either case he would have only Y or only X. He would not take combination R or N on a lower indifference curve I_1 because combination K or T is also available to him on a higher indifference curve I_2 .

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But there is another combination S which is on the highest indifference curve I_3 on this budget line PQ. Since all other combinations lie on lower indifference curves, they represent lower levels of satisfaction than combination S which is the consumer's equilibrium point. We may thus enumerate the conditions of consumer's equilibrium.

The consumer is in equilibrium when his budget line is tangent to an indifference curve. PQ is tangent to curve I_3 at S. At point S, he is also satisfying the budget equation

$$\begin{aligned} I(\text{Rs } 10) &= 04. P_x + 05. P_y = \\ &= 2\frac{1}{2} \text{ units of X. Rs. } 2 + 5 \text{ units of Y. Rs. } 1 \end{aligned}$$

$$= \text{Rs } 5 + \text{Rs } 5$$

$$= \text{Rs } 10$$

(2) At the point of Equilibrium the Slope of the Indifference Curve and of the Budget Line should be the Same. At S, the slope of the indifference curve is, in fact, the marginal rate of substitution of X for Y and on the budget line it is the ratio of the price of X to the price of Y. The slope of the budget line

$$\begin{aligned} PQ &= I/P \div I/P_x \\ &= I/P_y \times P_x/I = P_x/P_y \end{aligned}$$

And the slope of I_3 , curve is MRS_{xy} .

Thus $MRS_{xy} = P_x/P_y$ at point S in Fig. 12.12.

This is a necessary but not a sufficient condition for consumer's equilibrium.

(3) Indifference curve should be Convex to the Origin. Therefore, the last conditions are that at the point of equilibrium, the marginal rate of substitution of X for Y must be falling for equilibrium to be stable. It means that the indifference curve must be convex to the origin at the equilibrium point. If the indifference curve is concave to the origin at the point R, the MRS_{xy} increases.

The consumer is at the minimum point of satisfaction at R on the concave I_1 curve in Fig. 12.13. A movement away from R toward either axis along PQ would lead him to higher indifference curve. Point S on the curve I_1 is, in fact, the point of maximum satisfaction and of stable equilibrium.

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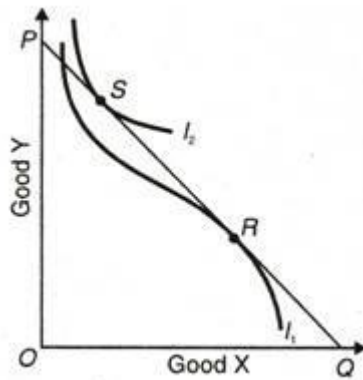


Fig. 12.13

Thus for equilibrium to be stable at any point on an indifference curve, the marginal rate of substitution between any two goods must be diminishing and be equal to their price ratio i.e. $MRS_{xy} = P_x/P_y$. Therefore, the indifference curve must be convex to the origin at the point of tangency with the budget line.

Marginal utility theory

Marginal utility theory examines the increase in satisfaction consumers gain from consuming an extra unit of a good.

- Utility is an idea that people get a certain level of satisfaction/happiness/utility from consuming goods and service.
- Marginal utility is the benefit of consuming an extra unit

This utility is not constant. Often we get diminishing marginal utility. The first piece of chocolate cake gives more utility than the 7th piece.

Quantity (Q)	Total Utility	Marginal Utility
1	120	120
2	210	90
3	270	60
4	300	30
5	300	0
6	270	-30
7	240	-60

In the above example, total utility (300) is maximised after just four pieces of chocolate cake.

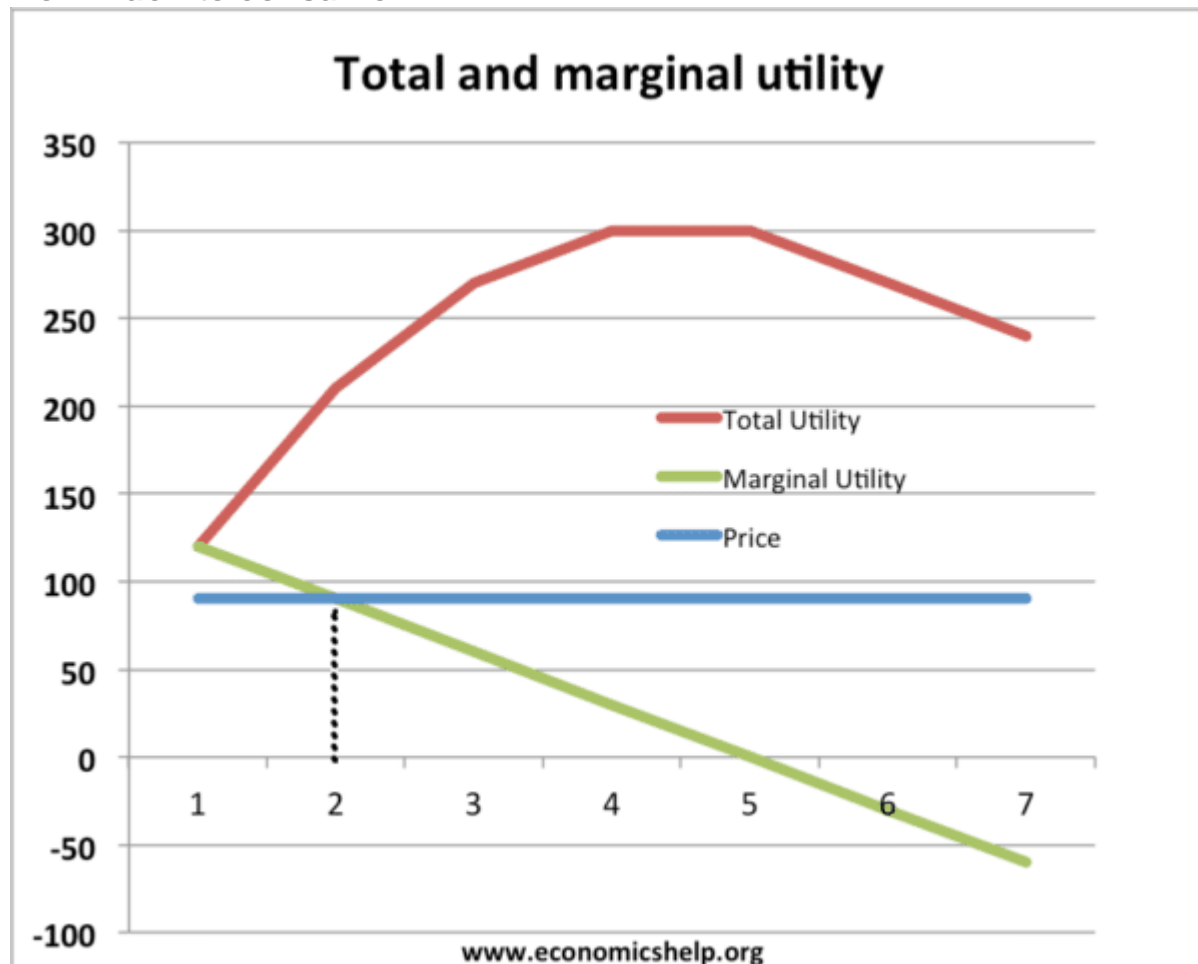
The fifth piece of chocolate cake gives zero marginal utility, so we are indifferent between 4 pieces and five pieces.

However, if we eat the sixth piece of chocolate cake, we start to feel ill – and so we get negative utility

Utility and price

- One way to measure utility is to give the utility a monetary value.
- For example, if I would pay £0.90 for a piece of cake, then we can say the utility is at least £0.90

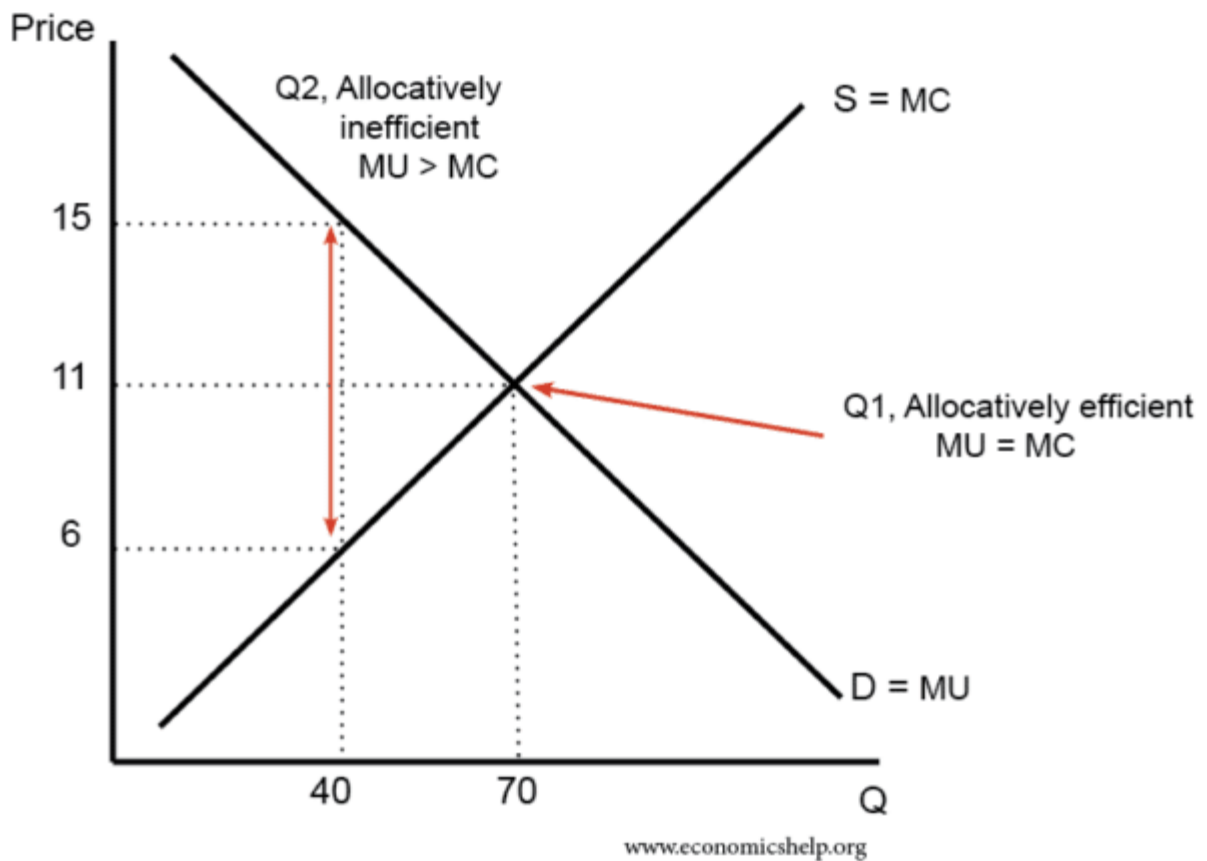
How much to consume?



- In the above example, if a piece of cake cost £0.90, it would make sense to consume two pieces.
- The first piece gives 120p of utility – which is greater than the price of 90p.
- The second piece gives a utility equal to the price.
- The third piece would give marginal utility of only 60p – which is less than the price of 90p

Marginal utility and allocative efficiency

Suppose the consumption was a quantity of 40. At this quantity, the price is £15, but the marginal cost is £6. In this case, the marginal benefit (utility) is greater than the marginal cost – there is a deadweight welfare loss and underconsumption of the good.

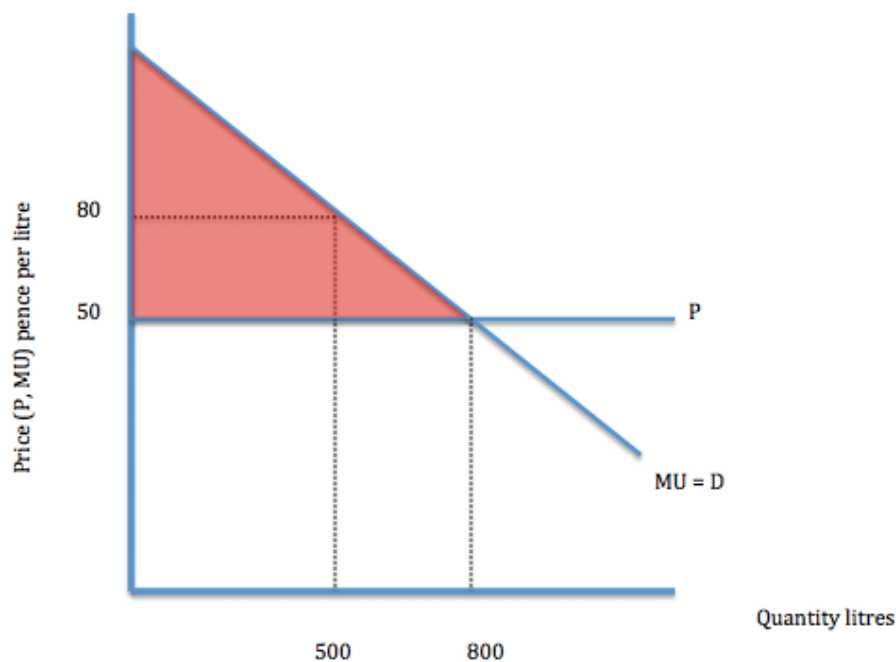


Allocative efficiency will occur at an output of 70 where $MC = MU$ of £11.

Consumer surplus

This is the excess of what a consumer would have been prepared to pay compared to what they actually pay.

A Person's Consumer Surplus from Petrol



www.economicshelp.org

- In the above diagram, at Q 500 litres, the MU is 80p > than the price = 50p.
- Therefore, a rational consumer will increase consumption of petrol, until the MU of petrol equals the price at 50p and a quantity of 800.
- Marginal Consumer Surplus = The excess of a person's total utility from the consumption of a good (MU) over the price paid: $MCS = MU - P$

The optimum level of consumption

For one good, the optimum level of consumption would be to consume a quantity of the good until the point where $MU = Price$.

There's no point paying 75p for cake if it only gives us 50p worth of utility.

Demand curve and Marginal Utility

Our demand curve is derived from our marginal utility.

If a good gives us more satisfaction, e.g. it becomes more fashionable, our MU and demand curve will shift to the right.

Choosing between different goods

In the real world, we are not just deciding how much of one good to buy. We are also deciding how to choose between different combinations of goods.

The Equi-Marginal principle in consumption states that consumers will maximise total utility from their incomes by consuming that combination of goods where:

$$\frac{MU_a}{P_a} = \frac{MU_b}{P_b}$$

$$MU_b = P_b$$

For example, suppose bread = £1 and Chicken = £2.

- Chicken is twice as expensive. Therefore, it would make sense to choose a quantity of chicken, where the marginal utility of chicken was twice the MU of bread.
- Therefore, you would tend to buy less chicken to make sure the marginal utility of chicken justified its higher price.
- If chicken was giving three times as much marginal utility but was only twice as expensive, it would make sense to buy more chicken until the marginal utility fell to that ratio.

Defining utility

- Utilitarianism of Bentham and Mill – the accumulation of pleasure and subtraction of pain.
- Cardinal utility – Neoclassical economists such as Alfred Marshall, Leon Walrus, and Carl Menger argued that utility could be measured in quantifiable measure (utils)
- Ordinal utility – Hicks argued that consumers struggled to give definitive utils but could put different choices in order preferences. J.R. Hicks developed this theory of ordinal utility.
- Satisfaction of wants. Austrian school – Von Mises also argued it was harder to quantify utility. He proposed that the satisfaction of wants could be measured to some extent but after that it was difficult.

Unit-3

What is demand in economics?

People demand goods and services in an economy to satisfy their wants. All goods and services have wants satisfying capacity which is known as "UTILITY" in economics. Utility is highly subjective concept; it is different from person to person. Utility (level of satisfaction) is measured by means of introspection. By demand for goods and services economists essentially mean is

willingness as well as ability of the consumer in procuring and consuming the goods and services. Thus, demand for a commodity or service is dependent upon (a) its utility to satisfy want or desire (b) capability of the prospective consumer to pay for the good or service. In nutshell therefore we can state that -

When desire is backed by willingness and ability to pay for a good or service then it becomes Demand for the good or service

Conceptually, demand is nothing but consumer's readiness to satisfy desire by paying for goods or services. A desire accompanied by ability and willingness to pay makes a real or effective demand.



Learning Objectives

After reading this chapter, you are expected to learn about:

- Understand the Concept of Demand
- Understand the Factors impacting Demand
- Understand the relationship between Demand and Price
- Understand the relationship between demand and other factors like Income of a consumer, Price of related goods, Advertisement, Change in Population etc



Significance of the concept of demand

Demand is one of the most important decision making variables in present globalised, liberalised and privatized economy. Under such type of an economy consumers and producers have wide choice. There is full freedom to both that is buyers and sellers in the market. Therefore Demand reflects the size and pattern of the market. The future of a producer is depends upon the well analysed consumer's demand. Even the firm dose not want to make profit as such but want to devote for 'customer services' or 'social responsibilities'. That is also not possible without evaluating the consumer's tastes, preferences, choice etc. All these things are directly built into the economic concept of demand.

The survival and the growth of any business enterprise depends upon the proper analysis of demand for its product in the market. Demand analysis has profound significance to management for day today functioning and expansion of the business. Thus the short term and long term decisions of the management are depend upon the trends in demand for the product. Any rise or fall in demand for the product has to be to find out reasons and revised production plans, technology or change in advertisement, packaging, quality etc.

The market system works in an orderly manner because it is governed by certain certain Fundamental Laws of Market known as Law of Demand and Supply The demand and supply forces determine the price of goods and services in the market. The laws of demand and supply plays very important role in economic analysis .Thomas Carlyle, the famous 19th century historian remarked "It is easy to make parrot learned in economics; teach a parrot to say demand

and supply” The most important function of microeconomics is to explain the laws of demand and supply, market mechanism and working of the price system. Here we will discuss the concept of demand and demand analysis.



Law of Demand

Law of demand states that whenever price of a product increases then the demand for that product decreases and vice versa provided other things remain constant. Here these other things are Income of the individual, Price of related goods, Tastes and preferences, Population, Advertisement etc. While studying the law of demand the direct relationship between price and demand is studied. This is because under the economic theory price of a product is considered as the main determinant of demand in the short run period.



Understanding Demand Function

Demand Function

As per the law of demand, demand is function of price provided other things remain constant

$D_x = f(P_x)$ D_x is demand for commodity X, which is dependent variable, and P_x is the price of X, which is independent variable. The demand function if considered as linear or straight line function can be expressed in the form up of following equation:

$$D_x = a + bP_x$$

Where a and b are constants. 'a' is intercept and 'b' quantifies the relationship between D_x and P_x . The demand price relationship can be both linear and non-linear. The relationship between demand and the price can also be expressed as follows:

$$\Delta P_x \rightarrow \Delta Q_{dx}$$

$$\uparrow P_x \rightarrow \downarrow Q_{dx}$$

$$\downarrow P_x \rightarrow \uparrow Q_{dx}$$

Here Q_{dx} indicates the change in the quantity of demand if the price changes and as per the law of demand an inverse or opposite relationship between price and quantity demanded of a commodity is assumed. In simple words, if the price of a product is high then its demand will be low and vice versa. This relationship is also exhibited in the digrammatic representation of the demand curve. To state more clearly, if we are digrammatically representing demand by taking demand on the X axis and the price of the product on the Y axis then we always get a demand curve sloping downwards from the left to right indicating the price demand relationship as expressed by the law of demand.



Understanding Demand Schedule

Demand Schedule

A demand schedule is the a tabular presentation of the different levels of prices at corresponding levels of quantity demanded of that commodity. It shows at different levels of prices higher or lower how the quantity demanded is different. This shows the relation ship between price and quantity demanded of a commodity i. e. law of demand.

Demand Schedule of Note Books	
Price per Notebook (Px)	Quantity of Notebooks Demanded (Dx)
25	2
20	4
15	8
10	10
8	12



Demand Curve

Demand Curve

Demand curve is the graphical representation of the demand schedule. Demand curve is obtained by plotting a demand schedule on a graph. As discussed earlier, demand curve slopes downward from left to right. It has a negative slope. It shows there is inverse relationship between price and quantity demanded of a commodity.

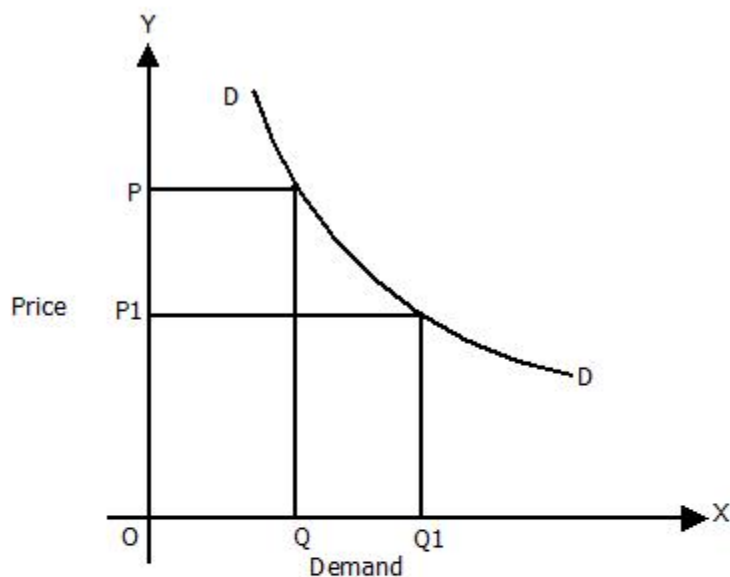
Again, as discussed earlier, Demand curve can be both Linear or Non-linear - If the Demand Curve is Non-linear then the equation of Demand is as follows:

$$Dx = aPx - b$$

If Demand Curve is Linear, then the equation of Demand curve is taken as follows:

$$Dx = a - bPx$$

The digrammatic representation of the Demand Curve can be as follows:



Understanding Variation of Demand

Variation in Demand

Expansion and Contraction of Demand

When demand changes due to change in price of that commodity then the phenomenon is known as variation or expansion or contraction in demand whereas when demand changes due to other factors, that is known as change in demand.

When we say the variation in demand takes place in the market for a particular product or service means this phenomenon occurs (that is rise or fall in demand) only because of change in its price. Here consumer remains on the same demand curve. He shifting up or down on the same demand curve as shown in dig. Therefore law of demand is concerned with the phenomenon that is VARIATION IN DEMAND which is accompanied by Rise and Fall in price, or known as expansion and contraction in demand.

Change in Demand

When we say the change in demand takes place in the market for a particular product or service means due change in its other factors like income, taste, preferences etc and not because of its price. Thus due to rise or fall in income of a consumer or change in preferences, taste etc there

is rise or fall in demand for a commodity or services. Here quantity demanded of a commodity is more or less at same or higher or lower price. Here consumer shift on higher demand curve to the right or lower demand curve to the left. This phenomenon is known as Change in Demand which is accompanied by increase and decrease in demand.



Why the Demand Curve is Downward Sloping?

Why does the demand curve slope downward from Left to Right?

The reasons behind the law of demand and the shape of demand curve are following.

- **Income Effect** When price of a commodity falls, real income (i.e. purchasing power) of a consumer increases in terms of that commodity. So our rational will consume more of relatively cheaper. Such increase in demand due to increase in real income is called as income effect.
- **Substitution Effect** When price of commodity falls, its becomes relatively cheaper compare to its other close substitutes Rational consumer will definitely buy more units of relatively cheaper good than relatively dearer whose price has remain same to maximize the satisfaction. On account of this factor is known as substitution effect.
- **Diminishing Marginal Utility** This also responsible for the for the increase in demand for 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 money is less than marginal utility of commodity . ($MUM < MUx$)

Therefore general shape of demand curve is negatively sloping downward from left to right. It positively slopes upward from left to right in case of inferior , Giffen or complimentary goods.



Understanding About Other Determinants of Demand

Other Determinants of Demand

Along with price there are many other factors which also influence the demand for a commodity. They are prices of its close substitutes, income of consumer, wealth, size of population, fashion, taste of consumer etc.

Therefore new demand function for long run is :

$Dx = f (Px, Py, Pn, Y, W, A, F, Zp, T, \text{etc})$ Where: Dx = Demand for a commodity

Px = Price of a commodity

Py = Price of a Y good which is close substitute for X good

Pn = Prices of n number of close substitutes

Y = Income of a consumer and Engle curves

W = Wealth of a consumer

A = Advertisement and Publicity

F = Fashion or demonstration effect

Zp = Size and composition of population of population

T = Taste and Preferences of a consumer

Exp = Expected price and utility at equilibrium

Cr = Existing short- term credit facilities

And there can be many more similar factors that may impact demand. All the above factors play very important role in the determining demand for a commodity or service if all the above stated factors are taken as variable. Here, it is important to understand that Law of Demand assumes partial equilibrium which means that if other things remain constant then whenever the price of a commodity changes then the demand for that commodity changes in the opposite direction.

If on the other hand, general equilibrium analysis is used in explaining the demand then impact of some of these other factors can be explained as follows:

- Price of a commodity – As the price of commodity falls a commodity becomes cheaper in a market and rational consumer will try to demand more units of the same to maximize his satisfaction and vice- versa when price rises. Therefore rise in price fall in demand and fall in price rise in demand.
- Prices of Close substitute - Demand for a commodity is also depend upon the prices of its close substitutes. If price of close substitute falls then demand for that commodity also falls and vice-versa. Therefore demand is also depends upon the number and degree of close substitutes available in market and the range of price change.
- Income of a consumer - Consumer's income is the basic determinant of the quantity demanded of the product. Generally the people with higher disposable income spend a larger amount of income than those with the lower income. Income demand relationship is more varied nature than that between demand and its other determinants. To explain the varied relationship between income and demand we classify goods and services into four broad categories, viz.(a)essential consumer goods; (b) inferior goods; (c) normal goods; and (d)prestige good or luxury goods. This is shown through Engels law of family expenditure.

a) Essential Consumers goods b) Inferior goods c) Normal goods d) Prestige or Luxury Goods 4. Wealth of a consumer 5. Advertisement and Publicity 6. Fashion or Demonstration Effect 7. Size and Composition of Population



Types of Demand

TYPES OF DEMANDS

- Direct demand and Derived demand.
- Individual demand and Market demand.

Domestic and Industrial Demand Autonomous and Induced Demand New and Replacement Demand etc.

Types of Price Elasticity of Demand – Explained!

Extent of responsiveness of demand with change in the price is not always the same.

The demand for a product can be elastic or inelastic, depending on the rate of change in the demand with respect to change in price of a product.

Elastic demand is the one when the response of demand is greater with a small proportionate change in the price. On the other hand, inelastic demand is the one when there is relatively a less change in the demand with a greater change in the price.

For better understanding the concepts of elastic and inelastic demand, the price elasticity of demand has been divided into five types, which are shown in Figure-1:

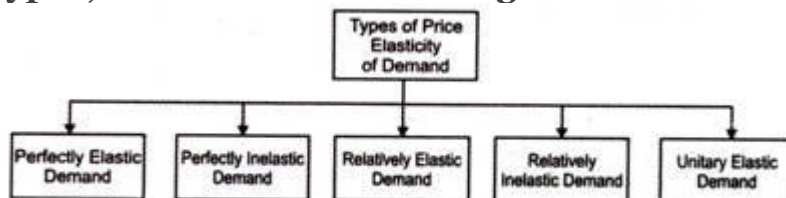


Figure-1: Different Types of Price Elasticity of Demand

Let us discuss the different types of price elasticity of demand (as shown in Figure-1).

1. Perfectly Elastic Demand:

When a small change in price of a product causes a major change in its demand, it is said to be perfectly elastic demand. In perfectly elastic demand, a small rise in price results in fall in demand to zero, while a small fall in price causes increase in demand to infinity. In such a case, the demand is perfectly elastic or $e_p = \infty$.

The degree of elasticity of demand helps in defining the shape and slope of a demand curve. Therefore, the elasticity of demand can be determined by the

slope of the demand curve. Flatter the slope of the demand curve, higher the elasticity of demand.

In perfectly elastic demand, the demand curve is represented as a horizontal straight line, which is shown in Figure-2:

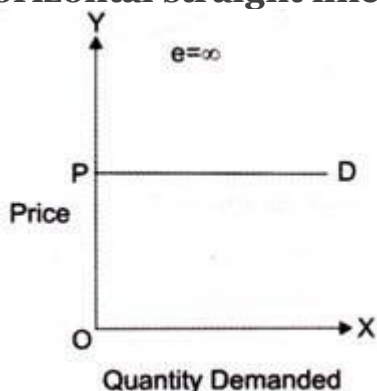


Figure-2: Perfectly Elastic Demand

From Figure-2 it can be interpreted that at price OP, demand is infinite; however, a slight rise in price would result in fall in demand to zero. It can also be interpreted from Figure-2 that at price P consumers are ready to buy as much quantity of the product as they want. However, a small rise in price would resist consumers to buy the product

Though, perfectly elastic demand is a theoretical concept and cannot be applied in the real situation. However, it can be applied in cases, such as perfectly competitive market and homogeneity products. In such cases, the demand for a product of an organization is assumed to be perfectly elastic.

From an organization's point of view, in a perfectly elastic demand situation, the organization can sell as much as it wants as consumers are ready to purchase a large quantity of product. However, a slight increase in price would stop the demand.

2. Perfectly Inelastic Demand:

A perfectly inelastic demand is one when there is no change produced in the demand of a product with change in its price. The numerical value for perfectly inelastic demand is zero ($e_p=0$).

In case of perfectly inelastic demand, demand curve is represented as a straight vertical line, which is shown in Figure-3:



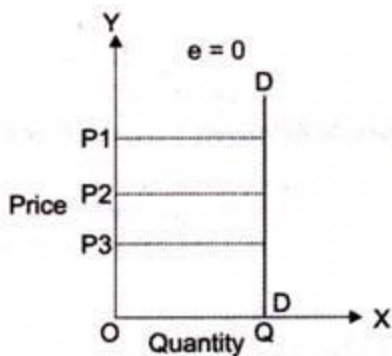


Figure-3: Perfectly Inelastic Demand

It can be interpreted from Figure-3 that the movement in price from OP1 to OP2 and OP2 to OP3 does not show any change in the demand of a product (OQ). The demand remains constant for any value of price. Perfectly inelastic demand is a theoretical concept and cannot be applied in a practical situation. However, in case of essential goods, such as salt, the demand does not change with change in price. Therefore, the demand for essential goods is perfectly inelastic.

3. Relatively Elastic Demand:

Relatively elastic demand refers to the demand when the proportionate change produced in demand is greater than the proportionate change in price of a product. The numerical value of relatively elastic demand ranges between one to infinity.

Mathematically, relatively elastic demand is known as more than unit elastic demand ($e_p > 1$). For example, if the price of a product increases by 20% and the demand of the product decreases by 25%, then the demand would be relatively elastic.

The demand curve of relatively elastic demand is gradually sloping, as shown in Figure-4:

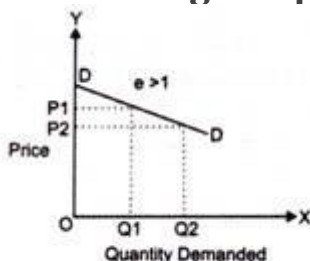


Figure-4: Relatively Elastic Demand

It can be interpreted from Figure-4 that the proportionate change in demand from OQ1 to OQ2 is relatively larger than the proportionate change in price from OP1 to OP2. Relatively elastic demand has a practical application as

demand for many of products respond in the same manner with respect to change in their prices.

For example, the price of a particular brand of cold drink increases from Rs. 15 to Rs. 20. In such a case, consumers may switch to another brand of cold drink. However, some of the consumers still consume the same brand. Therefore, a small change in price produces a larger change in demand of the product.

4. Relatively Inelastic Demand:

Relatively inelastic demand is one when the percentage change produced in demand is less than the percentage change in the price of a product. For example, if the price of a product increases by 30% and the demand for the product decreases only by 10%, then the demand would be called relatively inelastic. The numerical value of relatively elastic demand ranges between zero to one ($e_p < 1$). Marshall has termed relatively inelastic demand as elasticity being less than unity.

The demand curve of relatively inelastic demand is rapidly sloping, as shown in Figure-5:

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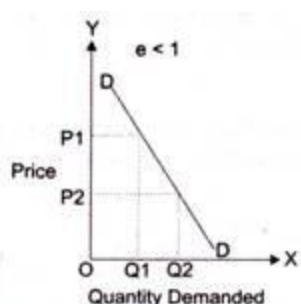


Figure-5: Relatively Inelastic Demand

It can be interpreted from Figure-5 that the proportionate change in demand from OQ1 to OQ2 is relatively smaller than the proportionate change in price from OP1 to OP2. Relatively inelastic demand has a practical application as demand for many of products respond in the same manner with respect to change in their prices. Let us understand the implication of relatively inelastic demand with the help of an example.

Example-3:

The demand schedule for milk is given in Table-3:

Table-3: Demand Schedule for Milk	
Price of Milk(per litre)	Quantity Demanded(litres)
15	100
20	90

Calculate the price elasticity of demand and determine the type of price elasticity.

Solution:

$$P = 15$$

ADVERTISEMENTS:

$$Q = 100$$

$$P_1 = 20$$

$$Q_1 = 90$$

Therefore, change in the price of milk is:

$$\Delta P = P_1 - P$$

$$\Delta P = 20 - 15$$

$$\Delta P = 5$$

Similarly, change in quantity demanded of milk is:

$$\Delta Q = Q_1 - Q$$

$$\Delta Q = 90 - 100$$

$$\Delta Q = -10$$

The change in demand shows a negative sign, which can be ignored. This is because of the reason that the relationship between price and demand is inverse that can yield a negative value of price or demand.

Price elasticity of demand for milk is:

$$e_p = \Delta Q / \Delta P * P / Q$$

$$e_p = 10 / 5 * 15 / 100$$

$$e_p = 0.3$$

The price elasticity of demand for milk is 0.3, which is less than one. Therefore, in such a case, the demand for milk is relatively inelastic.

5. Unitary Elastic Demand:

When the proportionate change in demand produces the same change in the price of the product, the demand is referred as unitary elastic demand. The numerical value for unitary elastic demand is equal to one ($e_p=1$).

The demand curve for unitary elastic demand is represented as a rectangular hyperbola, as shown in Figure-6:

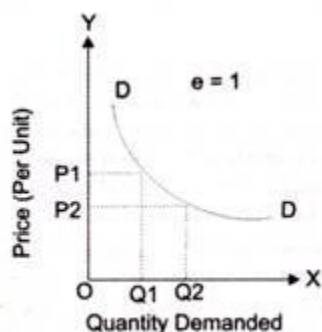


Figure-6: Unitary Elastic Demand

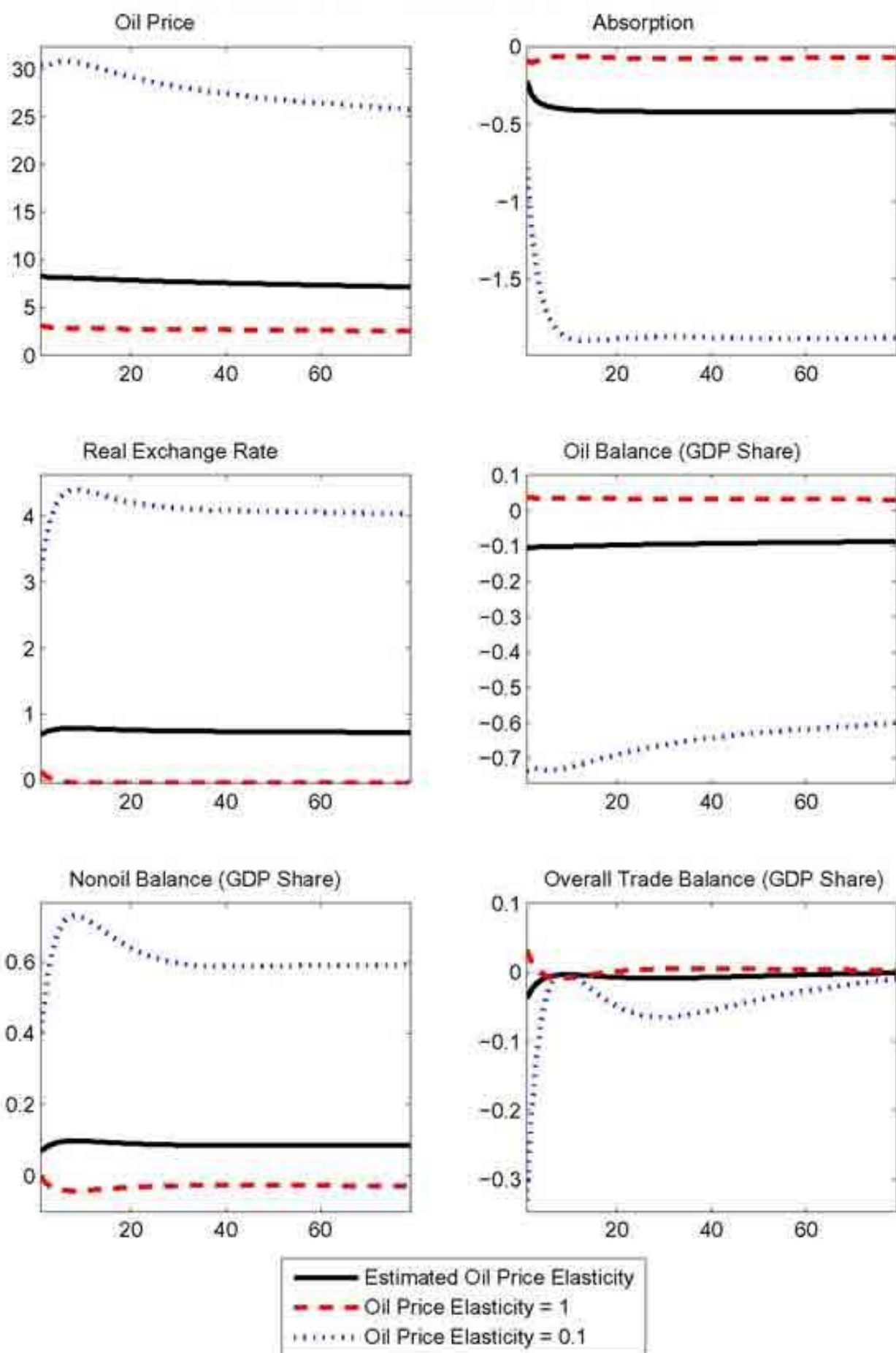
From Figure-6, it can be interpreted that change in price OP_1 to OP_2 produces the same change in demand from OQ_1 to OQ_2 . Therefore, the demand is unitary elastic.

The different types of price elasticity of demand are summarized in Table-4:

Table-4: Price Elasticity of Demand		
Numerical Value	Type of Price Elasticity	Description
$e_p = -\infty$	Perfectly elastic demand	There is a greater change in demand in response to percentage or smaller change in the price. For example, the demand for a product decreases or completely stops, with a little change in its price and vice versa.
$e_p = 0$	Perfectly inelastic demand	Consumers do not respond to the demand for a product with increase or decreases in its price. This implies that the demand remains the same with change in the price.
$e_p > 1$	Relatively elastic demand	The percentage change in the quantity demanded of a product is greater than percentage change in its price. In such a case, consumers generally switch to new brands when the price of a particular brand increases. However, some consumers are loyal to the same brand.
$e_p < 1$	Relatively inelastic demand	The change in the demand of a product is less than that of change in its price.
$e_p = 1$	Unitary elastic demand	The change in the demand and change in the price of a product is same.

Some of the major factors affecting the elasticity of demand of a commodity are as follows:

A change in price does not always lead to the same proportionate change in demand. For example, a small change in price of AC may affect its demand to a considerable extent/whereas, large change in price of salt may not affect its demand. So, elasticity of demand is different for different goods.



Various factors which affect the elasticity of demand of a commodity are:

1. Nature of commodity:

Elasticity of demand of a commodity is influenced by its nature. A commodity for a person may be a necessity, a comfort or a luxury.

i. When a commodity is a necessity like food grains, vegetables, medicines, etc., its demand is generally inelastic as it is required for human survival and its demand does not fluctuate much with change in price.

ii. When a commodity is a comfort like fan, refrigerator, etc., its demand is generally elastic as consumer can postpone its consumption.

iii. When a commodity is a luxury like AC, DVD player, etc., its demand is generally more elastic as compared to demand for comforts.

iv. The term 'luxury' is a relative term as any item (like AC), may be a luxury for a poor person but a necessity for a rich person.

2. Availability of substitutes:

Demand for a commodity with large number of substitutes will be more elastic. The reason is that even a small rise in its prices will induce the buyers to go for its substitutes. For example, a rise in the price of Pepsi encourages buyers to buy Coke and vice-versa.

:

Thus, availability of close substitutes makes the demand sensitive to change in the prices. On the other hand, commodities with few or no substitutes like wheat and salt have less price elasticity of demand.

3. Income Level:

Elasticity of demand for any commodity is generally less for higher income level groups in comparison to people with low incomes. It happens because rich people are not influenced much by changes in the price of goods. But, poor people are highly affected by increase or decrease in the price of goods. As a result, demand for lower income group is highly elastic.

4. Level of price:

Level of price also affects the price elasticity of demand. Costly goods like laptop, Plasma TV, etc. have highly elastic demand as their demand is very sensitive to changes in their prices. However, demand for inexpensive goods like needle, match box, etc. is inelastic as change in prices of such goods do not change their demand by a considerable amount.

5. Postponement of Consumption:

Commodities like biscuits, soft drinks, etc. whose demand is not urgent, have highly elastic demand as their consumption can be postponed in case of an increase in their prices. However, commodities with urgent demand like life saving drugs, have inelastic demand because of their immediate requirement.

6. Number of Uses:

:

If the commodity under consideration has several uses, then its demand will be elastic. When price of such a commodity increases, then it is generally put to only more urgent uses and, as a result, its demand falls. When the prices fall, then it is used for satisfying even less urgent needs and demand rises.

For example, electricity is a multiple-use commodity. Fall in its price will result in substantial increase in its demand, particularly in those uses (like AC, Heat convector, etc.), where it was not employed formerly due to its high price. On the other hand, a commodity with no or few alternative uses has less elastic demand.

7. Share in Total Expenditure:

Proportion of consumer's income that is spent on a particular commodity also influences the elasticity of demand for it. Greater the proportion of income spent on the commodity, more is the elasticity of demand for it and vice-versa.

Demand for goods like salt, needle, soap, match box, etc. tends to be inelastic as consumers spend a small proportion of their income on such goods. When prices of such goods change, consumers continue to purchase almost the same quantity of these goods. However, if the proportion of income spent on a commodity is large, then demand for such a commodity will be elastic.

8. Time Period:

Price elasticity of demand is always related to a period of time. It can be a day, a week, a month, a year or a period of several years. Elasticity of demand varies directly with the time period. Demand is generally inelastic in the short period.

It happens because consumers find it difficult to change their habits, in the short period, in order to respond to a change in the price of the given commodity. However, demand is more elastic in long run as it is comparatively easier to shift to other substitutes, if the price of the given commodity rises.

9. Habits:

Commodities, which have become habitual necessities for the consumers, have less elastic demand. It happens because such a commodity becomes a necessity for the consumer and he continues to purchase it even if its price rises. Alcohol, tobacco, cigarettes, etc. are some examples of habit forming commodities.

Finally it can be concluded that elasticity of demand for a commodity is affected by number of factors. However, it is difficult to say, which particular factor or combination of factors determines the elasticity. It all depends upon circumstances of each case.

Following are the determinants of demand for a product:

i. Price of a Product or Service:

Affects the demand of a product to a large extent. There is an inverse relationship between the price of a product and quantity demanded. The demand for a product decreases with increase in its price, while other factors are constant, and vice versa.

For example, consumers prefer to purchase a product in a large quantity when the price of the product is less. The price-demand relationship marks a significant contribution in oligopolistic market where the success of an organization depends on the result of price war between the organization and its competitors.

ii. Income:

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

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

The relationship between the income of a consumer and each of these goods is explained as follows:

a. Essential or Basic Consumer Goods:

Refer to goods that are consumed by all the people in the society. For example, food grains, soaps, oil, cooking fuel, and clothes. The quantity demanded for basic consumer goods increases with increase in the income of a consumer, but up to a fixed limit, while other factors are constant.

b. Normal Goods:

Refer to goods whose demand increases with increase in the consumer's income. For example, goods, such as clothing, vehicles, and food items, are demanded in relatively increasing quantity with increase in consumer's income. The demand for normal goods varies due to different rate of increase in consumers' income.

c. Inferior Goods:

Refer to goods whose demand decreases with increase in the income of consumers. For example, a consumer would prefer to purchase wheat and rice instead of millet and cooking gas instead of kerosene, with increase in his/her income. In such a case, millet and kerosene are inferior goods for the consumer.

However, these two goods can be normal goods for people having lower level of income. Therefore, we can say that goods are not always inferior or normal; it is the level of income of consumers and their perception about the need of goods

d. Luxury Goods:

Refer to goods whose demand increases with increase in consumer's income. Luxury goods are used for the pleasure and esteem of consumers. For example, expensive jewellery items, luxury cars, antique paintings and wines, and air travelling.

iii. Tastes and Preferences of Consumers:

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

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

Apart from this, demand is also influenced by the habits of consumers. For instance, most of the South Indians are non-vegetarian; therefore, the demand for non-vegetarian products is higher in Southern India. In addition, sex ratio has a relative impact on the demand for many products.

For instance, if females are large in number as compared to males in a particular area, then the demand for feminine products, such as make-up kits and cosmetics, would be high in that area.

iv. Price of Related Goods:

Refer to the fact that the demand for a specific product is influenced by the price of related goods to a greater extent.

Related goods can be of two types, namely, substitutes and complementary goods, which are explained as follows:

a. Substitutes:

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

b. Complementary Goods:

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

v. Expectations of Consumers:

Implies that expectations of consumers about future changes in the price of a product affect the demand for that product in the short run. For example, if consumers expect that the prices of petrol would rise in the next week, then the demand of petrol would increase in the present.

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

vi. Effect of Advertisements:

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

vii. Distribution of Income in the Society:

Influences the demand for a product in the market to a large extent. If income is equally distributed among people in the society, the demand for products would be higher than in case of unequal distribution of income. However, the distribution of income in the society varies widely.

This leads to the high or low consumption of a product by different segments of the society. For example, the high income segment of the society would prefer luxury goods, while the low income segment would prefer necessary goods. In such a scenario, demand for luxury goods would increase in the high

income segment, whereas demand for necessity goods would increase in the low income segment.

viii. Growth of Population:

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

ix. Government Policy:

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

x. Climatic Conditions:

Affect the demand of a product to a greater extent. For example, the demand of ice-creams and cold drinks increases in summer, while tea and coffee are .

Unit-4

revenue, Cost, and Profit

Most businesses sell something—either a physical commodity like an ice cream bar or a service like a car repair. In a modern economy, that sale is made in return for money or at least is evaluated in monetary terms. The total monetary value of the goods or services sold is called revenue.

Few businesses are able to sell something without incurring expenses to make the sale possible. The collective expenses incurred to generate revenue over a period of time, expressed in terms of monetary value, are the cost. Some cost elements are

related to the volume of sales; that is, as sales go up, the expenses go up. These costs are called variable costs. The cost of raw materials used to make an item of clothing would be an example of a variable cost. Other costs are largely invariant to the volume of sales, at least within a certain range of sales volumes. These costs are called fixed costs. The cost of a machine for cutting cloth to make an item of clothing would be a fixed cost.

Businesses are viable on a sustained basis only when the revenue generated by the business generally exceeds the cost incurred in operating the business. The difference between the revenue and cost (found by subtracting the cost from the revenue) is called the profit. When costs exceed revenue, there is a negative profit, or loss.

The students in our simple venture realize they need to determine whether they can make a profit from a summer ice cream bar business. They met the person who operated an ice cream bar business in this building the previous summer. He told them last summer he charged \$1.50 per ice cream bar and sold 36,000 ice cream bars. He said the cost of the ice cream bars—wholesale purchase, delivery, storage, and so on—comes to about \$0.30 per bar. He indicated his other main costs—leasing the building, license, local business association fee, and insurance—came to about \$16,000.

Based on this limited information, the students could determine a rough estimate of the revenue, costs, and profit they would have if they were to repeat the outcomes for the prior operator. The revenue would be \$1.50 per ice cream bar times 36,000 ice cream bars, or \$54,000. The variable cost would be \$0.30 per ice cream bar times 36,000 ice cream bars, or \$10,800. The fixed cost would be \$16,000, making the total cost \$26,800. The profit would be \$54,000 minus \$26,800, or \$27,200.

Based on this analysis, the students are confident the summer business venture can make money. They approach the owner of the building and learn that if they want to reserve the right of first option to lease the building over the summer, they will need to make a nonrefundable \$6000 deposit that will be applied to the lease. They proceeded to make that deposit.

A few weeks later, all three students were unexpectedly offered summer business internships at a large corporation. Each student would earn \$10,000. However, the work site for the internships is far from the beach and they would be in an office all day. They now must decide whether to accept the internships and terminate their plan to run a business at the beach or turn down the internships.

Definition: A demand schedule is a chart that shows the number of goods or services demanded at specific prices. In other words, it's a table that shows the relationship between the price of goods and the amount of goods consumers are willing and able to pay for them at that price.

What Does Demand Schedule Mean?

What is the definition of demand schedule? This schedule is based on the [demand curve](#) that illustrates inverse relationship between [quantities demanded](#) and price. As the price of a good increases, the quantity demanded decreases.

The table simply takes the plotted points on the demand curve and puts them on a table. In an effort to plan production processes, management can look at the schedule and figure out how many units consumers will demand based on the price.

They can also use this schedule to maximize profits by pricing goods or services according to their [demand elasticity](#). In other words, they might be able to maximize profits by selling fewer high priced goods than many more low priced goods.

eXample

Alex, a new storeowner, wants to estimate the demand for his goods, so he gives a survey to his potential customers. The survey is comprised of different prices they would be willing to pay for the same product. Every participant in the survey is asked to provide the highest dollar amount they would pay.

He collects the surveys then plots them with a demand curve with quantity demanded on X-axis and Price on Y-axis. It shows that at \$4.99, 14 people would buy the product and at \$6.99, 10 people would buy it. Going down the list of prices he makes a table showing the amount demanded according to each price. Using this schedule, Alex can make decisions on how much to charge and how it will affect his profits.

The demand schedule is often accompanied by a [supply schedule](#). The point at which both charts intersect is called the [equilibrium](#). This price and quantity is the optimal point for the market.

Summary Definition

Define Demand Schedule: Demand schedule means a table that lists the quantity demanded for a good or service at different price levels.

Fixed Costs (FC) The costs which don't vary with changing output. [Fixed costs](#) might include the cost of building a factory, insurance and legal bills. Even if your output changes or you don't produce anything, your fixed costs stay the same. In the above example, fixed costs are always £1,000.

Variable Costs (VC) Costs which depend on the output produced. For example, if you produce more cars, you have to use more raw materials such as metal. This is a [variable cost](#).

Semi-Variable Cost. Labour might be a semi-variable cost. If you produce more cars, you need to employ more workers; this is a variable cost. However, even if you didn't produce any cars, you may still need some workers to look after an empty factory.

Total Costs (TC) = Fixed + Variable Costs

Marginal Costs – Marginal cost is the cost of producing an extra unit. If the total cost of 3 units is 1550, and the total cost of 4 units is 1900. The marginal cost of the 4th unit is 350.

Opportunity Cost – Opportunity cost is the next best alternative foregone. If you invest £1million in developing a cure for pancreatic cancer, the opportunity cost is that you can't use that money to invest in developing a cure for skin cancer.

Economic Cost. Economic cost includes both the actual direct costs (accounting costs) plus the opportunity cost. For example, if you take time off work to a training scheme. You may lose a weeks pay of £350, plus also have to pay the direct cost of £200. Thus the total economic cost = £550.

Accounting Costs – this is the monetary outlay for producing a certain good. Accounting costs will include your variable and fixed costs you have to pay.

Sunk Costs. These are costs that have been incurred and cannot be recouped. If you left the industry, you could not reclaim sunk costs. For example, if you spend money on advertising to enter an industry, you can never claim these costs back. If you buy a machine, you might be able to sell if you leave the industry. See: [Sunk cost fallacy](#)

Avoidable Costs. Costs that can be avoided. If you stop producing cars, you don't have to pay for extra raw materials and electricity. Sometimes known as an escapable cost.

Explicit costs – these are costs that a firm directly pays for and can be seen on the accounting sheet. Explicit costs can be variable or fixed, just a clear amount.

Implicit costs – these are opportunity costs, which do not necessarily appear on its balance sheet but affect the firm. For example, if a firm used its assets, like a printing press to print leaflets for a charity, it means that it loses out on revenue from producing commercial leaflets.

Market Failure

- **Social Costs.** This is the total cost to society. It will include the private costs plus also the external cost (cost incurred by a third party). May also be referred to as 'True costs'
- **External Costs.** This is the cost imposed on a third party. For example, if you smoke, some people may suffer from passive smoking. That is the external cost.
- **Private Costs.** The costs you pay. e.g. the private cost of a packet of cigarettes is £6.10
- **Social Marginal Cost.** The total cost to society of producing one extra unit. Social Marginal Cost (SMC) = Private marginal cost (PMC) + External marginal Cost (XMC)

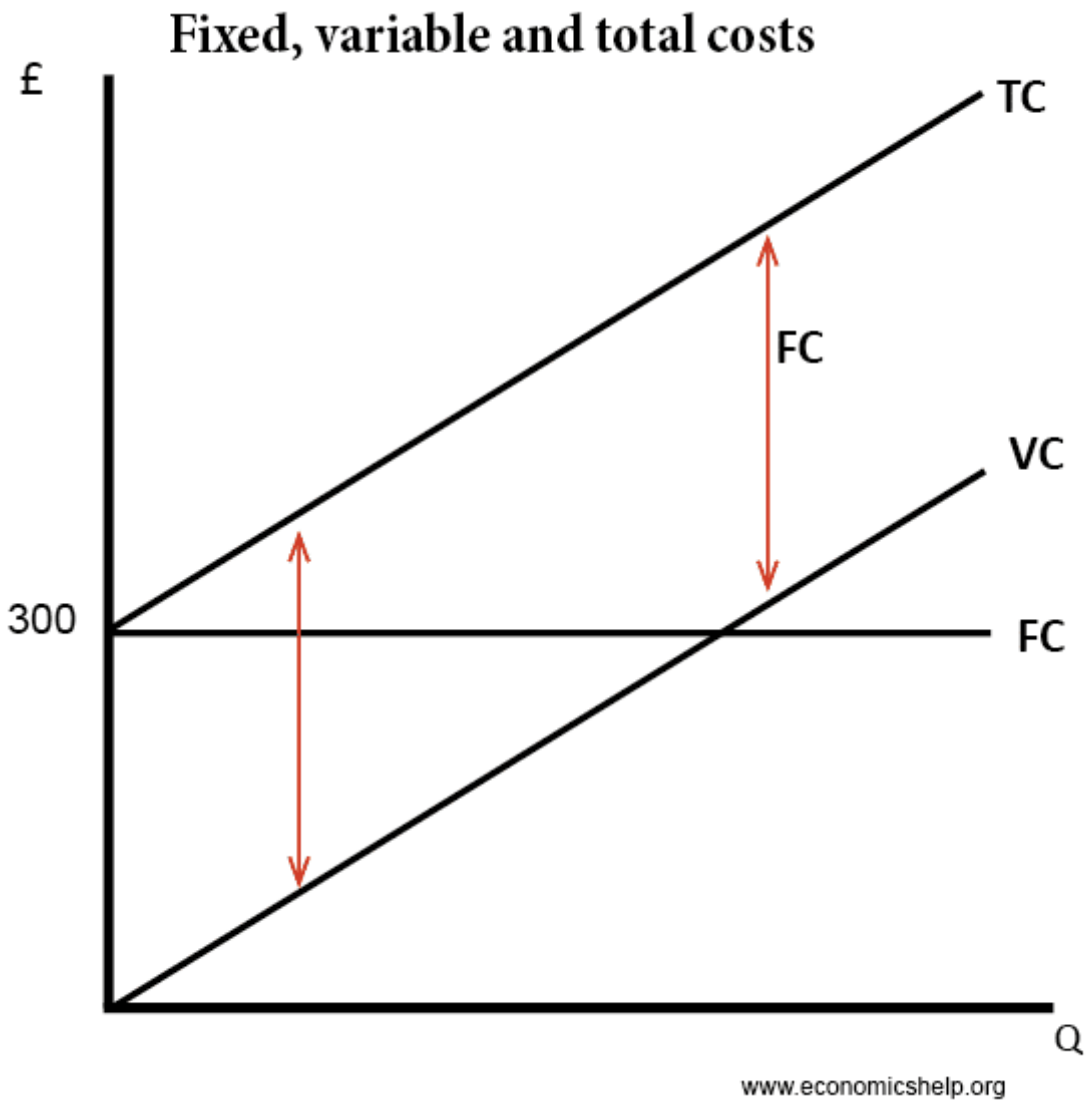
Diagram of Costs

For full diagrams of costs see: [Diagrams of cost curves](#)

Average Cost Curves

- ATC (Average Total Cost) = Total Cost / quantity
- AVC (Average Variable Cost) = Variable cost / quantity
- MC = Marginal cost.
- AFC (Average Fixed Cost) = Fixed cost / quantity

Total costs

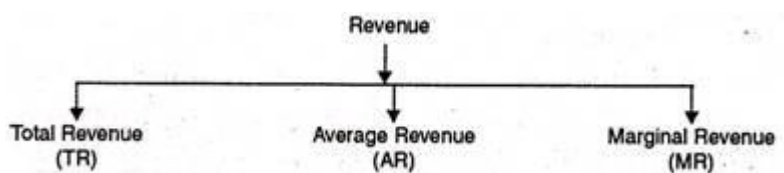


Total cost (TC) = Variable cost (VC) + fixed costs (FC)

Revenue Types : Total, Average and Marginal Revenue!

The term revenue refers to the income obtained by a firm through the sale of goods at different prices. In the words of Dooley, ‘the revenue of a firm is its sales, receipts or income’.

The revenue concepts are concerned with Total Revenue, Average Revenue and Marginal Revenue.



1. Total Revenue:

The income earned by a seller or producer after selling the output is called the total revenue. In fact, total revenue is the multiple of price and output. The behavior of total revenue depends on the market where the firm produces or sells.

“Total revenue is the sum of all sales, receipts or income of a firm.” Dooley

Total revenue may be defined as the “product of planned sales (output) and expected selling price.” Clower and Due

“Total revenue at any output is equal to price per unit multiplied by quantity sold.” Stonier and Hague

Thus,

$$\text{TR} = \text{AR} \times \text{Q}$$

where

TR = Total Revenue
AR = Average Revenue or Price per Unit
Q = Output

For example if the price of a commodity is Rs. 100 and total units sold are 20 in that case total revenue will be

$$\text{TR} = 100 \times 20 = 2000$$

2. Average Revenue:

Average revenue refers to the revenue obtained by the seller by selling the per unit commodity. It is obtained by dividing the total revenue by total output.

“The average revenue curve shows that the price of the firm’s product is the same at each level of output.” Stonier and Hague

Thus :

$$\text{AR} = \frac{\text{TR}}{\text{Q}}$$

where

AR = Average Revenue
TR = Total Revenue
Q = Output

According to McDonnell, “Average Revenue is the per unit revenue received from the sale of one unit of a commodity.”

$$\text{TR} = \text{Price} \times \text{Output}$$
$$\text{TR} = Pq$$
$$\text{AR} = \frac{Pq}{q} = P$$

and $P = f(Q)$ is an average curve which shows that price is a function of quantity demanded. It is also a demand curve.

3. Marginal Revenue:

Marginal revenue is the net revenue obtained by selling an additional unit of the commodity. "Marginal revenue is the change in total revenue which results from the sale of one more or one less unit of output." Ferguson. Thus, marginal revenue is the addition made to the total revenue by selling one more unit of the good. In algebraic terms, marginal revenue is the net addition to the total revenue by selling n units of a commodity instead of $n - 1$.

Therefore,

$$MR = \frac{\Delta TR}{\Delta Q}$$

$$MR_n = TR_n - TR_{n-1}$$

Whereas

TR_n = Total Revenue of ' n ' units

TR_{n-1} = Total Revenue from $(n - 1)$ units

$MR_{(nth)}$ = Marginal revenue from n th unit

n = Any given number

A. Koutsoyiannis, "The marginal revenue is the change in total revenue resulting from selling an additional unit of the commodity."

If total revenue from (n) units is 110 and from $(n - 1)$ units is 100.

in that case

$$MR_{nth} = TR_n - TR_{n-1} = 110 - 100$$

$$MR_{nth} = 10$$

MR in mathematical terms is the ratio of change in total revenue to change in output

$$MR = \Delta TR / \Delta q \text{ or } dR/dq = MR$$

Total Revenue, Average Revenue and Marginal Revenue:

ADVERTISEMENTS:

The relation of total revenue, average revenue and marginal revenue can be explained with the help of table and fig.

Table Representation:

The relationship between TR, AR and MR can be expressed with the help of a table 1.

Table 1

Unit (q)	TR/q AR or Price	(Pq) TR	(TR _n - TR _{n-1}) MR
1	10	10	10
2	9	18	8
3	8	24	6
4	7	28	4
5	6	30	2
6	5	30	0
7	4	28	- 2
8	3	24	- 4
9	2	18	- 6
10	1	10	- 8

From the table 1 we can draw the idea that as the price falls from Rs. 10 to Re. 1, the output sold increases from 1 to 10. Total revenue increases from 10 to 30, at 5 units. However, at 6th unit it becomes constant and ultimately starts falling at next unit i.e. 7th. In the same way, when AR falls, MR falls more and becomes zero at 6th unit and then negative. Therefore, it is clear that when AR falls, MR also falls more than that of AR: TR increases initially at a diminishing rate, it reaches maximum and then starts falling.

The formula to calculate TR, AR and MR is as under:

$$TR = P \times q$$

$$\text{Or } TR = MR_1 + MR_2 + MR_3 + MR_4 + \dots \quad MR = TR_n - TR_{n-1}$$

In fig. 1 three concepts of revenue have been explained. The units of output have been shown on horizontal axis while revenue on vertical axis. Here TR, AR, MR are total revenue, average revenue and marginal revenue curves respectively.

In figure 1 (A), a total revenue curve is sloping upward from the origin to point K. From point K to K' total revenue is constant. But at point K' total revenue is maximum and begins to fall. It means even by selling more units total revenue is falling. In such a situation, marginal revenue becomes negative.

Similarly, in the figure 1 (B) average revenue curves are sloping downward. It means average revenue falls as more and more units are sold.

fig. 1 (B) MR is the marginal revenue curve which slopes downward. It signifies the fact that MR with the sale of every additional unit tends to diminish. Moreover, it is also clear from the fig. that when both AR and MR

are falling, MR is less than AR. MR can be zero, positive or negative but AR is always positive.

