UNIT 2 MICRO-ECONOMICS FOR ENGINEERS

Structure

2.1 INTRODUCTION

It is important to study the economic behaviour of consumers, firms and also their interactions at the market place for managers and engineers as it provides a sound basis for decision-making. The relevant topics include demand, cost, pricing and market structure. The study of these topics helps frame principles and rules to attain the desired economic goals of management.

Objectives

After studying this unit, you should be able to

- describe how consumers make their decisions to buy what goods and services and how much,
- describe how to optimise their purchase/consumption given the constraint of their income (budget) and prices of goods and services so as to maximize the satisfaction or utility derived from such consumption,
- discuss the extent to which they can substitute under different forms of market structure, and
- analyse above mentioned decisions from firms' point of view.

2.2 DEMAND ANALYSIS

Demand for goods and services arises from wants or desires on the part of individuals and households. However, such desire in itself does not constitute demand. A lot of people want a whole lot of things but it has no economic significance. Desires or wants must be backed by purchasing power in order to take the form of effective demand at the market place. That is to say, consumers must be willing and able to buy. Thus, consumers demand for goods is governed by their income, price of the good in question and prices of other related goods. Also, because they are required to pay for the goods and services, they usually choose among the alternatives. The choice on the part of the consumer is based on utility or satisfaction obtainable from the particular good or service on the one hand and its scarcity on the other. This explains the reason why even the most useful item like water is priced little or nothing whereas least valuable items like diamond commands a very high price. The former despite having immense utility is abundant and a nature's bounty whereas the latter despite having little value is scarce indeed.

2.2.1 The Law of Demand

It has been found that consumers trend to buy more a goods (service) when its price falls and less it when the source rises.This inverse relationship is described by a demand curve shown in Figure 2.1 which is negatively sloped.

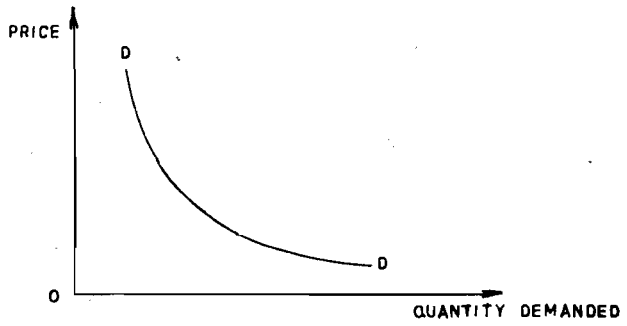


Figure 2.1 : Demand Curve

The horizontal summation of such individual demand curves gives us the market demand curve for that particular good (service) be it foodgrains, processed food, milk, oils, fats textiles, footwear, cement or transport, entertainment and other services. While the law of demand holds true in general in respect of normal goods, it is often violated in the case of inferior goods like salt, necessities consumed by the poor sections of people such as course grains, cows, cloth. So also is the case with certain luxuries like precious stones, highly priced cars and works of art. Such exception to the law of demand are also explained later in the following section.

2.2.2 Demand Elasticities

They refer to responsiveness of demand for a particular good/commodity with respect to changes in the determinants of its demand. So elasticity is always with respect to something and there are as many elasticities of demand as there are demand-determinants. Mainly, we have

(a) Price elasticity of demand,

(b) Income elasticity of demand,

(c) Cross elasticity of demand,

(d) Promotional (advert) elasticity of demand, and

(e) Interest elasticity of demand.

In general, elasticity of variable x with respect to variable y is defined as

$$e_{x,y} = \frac{\text{Percentage change in } x}{\text{Percentage change in } y} = \frac{\left(\frac{\Delta x}{x}\right)100}{\left(\frac{\Delta y}{y}\right)100} = \frac{\Delta x}{\Delta y} \cdot \frac{y}{x}$$

An Illustrative Example : Computation of Price Elasticity of Demand

Quantity Demanded Q	ΔQ	Price P	ΔP	$\frac{Q_1+Q_2}{2}$	$\frac{P_1+P_2}{2}$	$e = \frac{\left(\frac{(2)}{(5)}\right)}{\left(\frac{(4)}{(6)}\right)}$
(1)	(2)	(3)	(4)	(5)	(6)	
0		5				
	8		2	4	4	[(8/4)]/[(2/4)] = 4
8		3				
	8		2	12	2	[(8/12)]/[(2/2)] = 0.67
16		1				
	8		1	20	0.5	[(8/20)]/[(1/0.5)] = 0.2
24		0				

There are 5 critical values for this elasticity ranging from 0 to ∞.They are as follows :

$$0,\ <1,\ 1,\ >1,\ \infty$$

Zero Price Elasticity

This is a case where demand is perfectly inelastic, i.e. demand is invariate to all change in price. Salt would be the closest example of this.

Price Elasticity < 1

Here demand is said to be relatively price inelastic, i.e. changes in price leads to less than proportionate change in demand. It is true with all the essential items of consumption.

Unit Price Elasticity

Here demand changes proportionately to changes in price.

Price Elasticity > 1

When percentage change in demand is greater than that of price. In such a case, we say demand is relatively price elastic.

Infinite Price Elasticity

Refers to as situation where demand is unlimited or ∞ at given price. In a perfectly competitive market, demand is said to be infinitely elastic or perfectly elastic.

The following diagrams illustrate these cases.

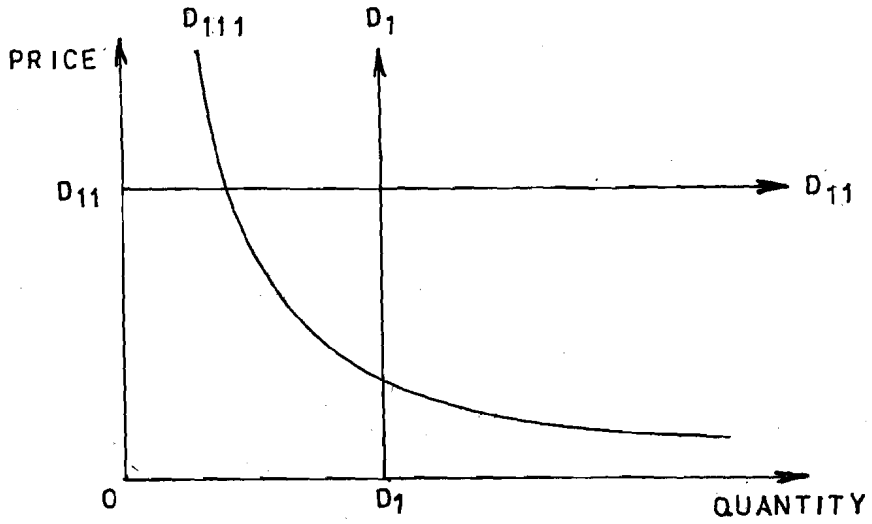


Figure 2.2

However, on a falling straight line demand curve elasticity varies from point to point as is seen in Figure 2.3.

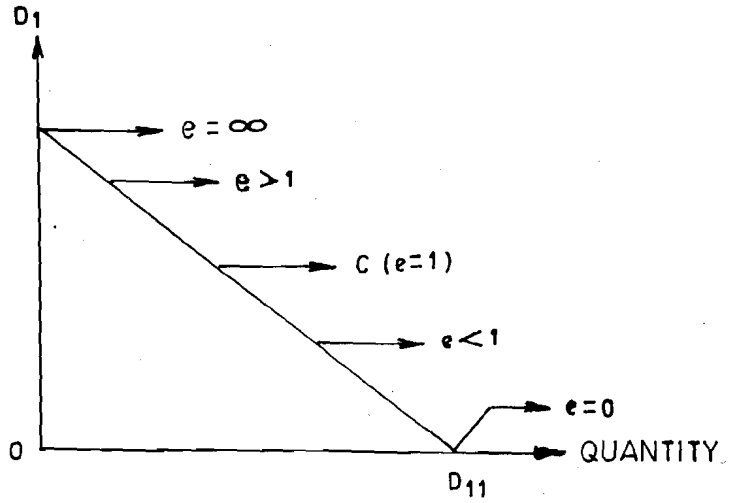


Figure 2.3

Along this demand curve, elasticity is higher as one approaches point D_I and lower as one approaches point D_{II}.

Factors governing price elasticity of demand are as follows :

(a) nature of the goods whether essential or luxury type,

(b) availability of substitute & their closeness, and

(c) proportion of income spent on the item in question.

Consumer demand would be sensitive or more elastic for items like petrol, tomatoes, green peas, seasonal fruits like mangoes & apples and taxi service. However, in the case of necessities like foodgrains electricity travel and fuel elasticity value would be low. Secondly, closer the substitutes availability for a product, the greater would be the price elasticity. This is due to the substitution effect.

Therefore, the demand for Maruti-800 would be more elastic than demand for cars in general as substitutes are available within the product group.

Similarly, for say, a Hero Honda Motor cycle or Videocon TV as compared to their product-groups or industry demand as a whole.

Thirdly, the larger the proportion of income spent on a good, the greater is the price elasticity of demand. This is so because of the income effect.

Income Elasticity of Demand

Measures the sensitiveness of demand to changes in consumer's income.

Symbolically,

$$e_{Q,y} = \frac{\Delta Q}{\Delta y} \cdot \frac{y}{Q}$$

and is positive for normal goods and negative for inferior goods.

For luxury goods it is $> +1$

For semi-luxuries it is $\approx +1$

For necessities and normal goods it is $< +1$

Therefore, in a growing economy, farmers tend to lose while industrialists tend to gain (farmers produce necessities with low income-elasticity of demand and industry produces goods with relatively higher income elasticity of demand).

Cross-elasticity of Demand

It is the responsiveness of demand for good x to changes in the price of good y.

Symbolically,

$$e_{Q_x, P_y} = \frac{\Delta Q_x}{\Delta P_y} \cdot \frac{P_y}{Q_x}$$

and is positive if x and y are substitutes and negative if they are complements.

Promotional Elasticity

It is the sensitiveness of demand for a good to change in advertisement expenditure.

Symbolically,

$$e_{Q,A} = \frac{\Delta Q}{\Delta A} \cdot \frac{A}{Q}$$

Interest Elasticity

It is for housing construction activity etc.

Symbolically,

$$e_{Q,i} = \frac{\Delta Q}{\Delta i} \cdot \frac{i}{Q}$$

2.2.3 Demand Revenue Relationship

We now proceed to establish a relationship between demand for a product and the revenue generated by that product.

We have, $$TR = P.Q \tag{2.1}$$

$$AR = \frac{TR}{Q} = \frac{QP}{Q} = P \tag{2.2}$$

Also, $$MR = \frac{d(TR)}{dQ} = \frac{\Delta TR}{\Delta Q} \tag{2.3}$$

But, $$TR = PQ$$

$$MR = P + Q \cdot \frac{dP}{dQ}$$

and $$MR = P\left(1 + \frac{Q}{P} \cdot \frac{dP}{dQ}\right)$$

i.e. $$MR = P\left(1 + \frac{1}{e}\right) \tag{2.4a}$$

and, since e is negative for normal foods, we get,

$$MR = P\left(1 - \frac{1}{e}\right) \tag{2.4b}$$

Now, we can say,

(a) If $|e| = -1$, $MR = 0$ and TR = constant, and P & Q change.

(b) If $|e| > -1$, $MR > 0$ and as P falls both TR and Q increase and vice-versa.

(c) If $|e| < -1$, $MR < 0$ and as TR decreases Q increases and vice-versa.

Relationship between Price Elasticity of Demand and Total Revenue

Value of Elasticity	Name of Demand	Effects on Total Revenue
e > 1	Elastic Demand	Revenue rises as price falls Revenue falls as price increases
e = 1	Unit Elastic Demand	Revenue remains unchanged with rise or fall in price
e < 1	Inelastic Demand	Revenue falls as price decreases Revenue rises as price increases

SAQ 1

(a) What are the important determinants of demand for a goods ?

(b) Define the concept of elasticity of demand and explain its usefulness ?

(c) What are the different measures of elasticity of demand ?

(d) Is the following statement true or false ? Justify your answer.

"The price elasticity of demand for electricity for domestic use is lower than for industrial use."

2.3 COST AND PRODUCTION ANALYSIS

A firm is a technical unit engaged in the production of goods/services and sale of them. In other words, their activity is to transform inputs into outputs and or distribute such outputs.

For economists, the term, 'production' has a broad meaning. It includes tangible as well as intangible goods. Therefore, activities like transporting, storage and packaging even trading or service like health, banking, insurance and other service rendered for a fee/payment are all treated as production activities.

The entrepreneur (owner/manager) of the firm decides what to produce, how much to produce and how one or more goods will be produced. His decisions may yield gains (profits) or result in losses for him. The result will be a profit if the difference between his revenue from the sale of outputs and the cost of his inputs is positive; a loss if this difference is negative.

Sl. No.	Points of Similarities between the Theory of the Firm and Theory of Consumer Behaviour	Sl. No.	Points of Differences between the Theory of the Firm and Theory of Consumer Behaviour
(1)	The Consumer produces utility or satisfaction and the firm produces goods/services.	(1)	A utility function is subjective while a production function is objective.
(2)	The Consumer possesses a utility function and the firm possesses a production function.	(2)	A single firm may produce more than one output.
(3)	The Consumer's budget equation is a linear function of the amounts of commodities he purchases whereas a competitive cost equation is a linear function of amounts of inputs it purchases.	(3)	Maximisation action goes one step further from the analogous maximization of profit.
(4)	The rational consumer maximises utility and the rational entrepreneur maximises profits.		

In what follows, let us try to understand some basic concepts like production function, its nature, productivity curve and isoquants and then proceed to derive alternative modes of optimizing behaviour.

2.3.1 Production Function

It gives mathematical expression to the relationship between the quantities of inputs an entrepreneur employs and the quantity of output produces.

$$Q = f(x_1, x_2) \tag{2.5}$$

where,

Q = quantity of output,

x_1 = quantity of input 1, and

x_2 = quantity of input 2.

It presupposes technical efficiency and states the maximum output obtainable from every possible input combination i.e., selection of the best input combination is an economic problem. But utilization of any input combination is an engineering or technical problem. In a very general and broad form, we may express it as follows :

$$Q = f(K, L, LD, M, T) \tag{2.6}$$

where,

K = Capital units,

L = Labour units,

LD = Land units,

M = Managerial, and

T = Technology employed (e.g. computerisation training programmes).

Here,

$$f_1, f_2, f_3, f_4, f_5 > 0 \tag{2.7}$$

Short Run and Long Run

Inputs and outputs are rates of flow per unit of time. Hence, the distinction between short-run and long-run is important.

Short-run is the period during which at least one of the factors of production/inputs is available in a fixed quantity. During that period production could be increased or decreased by change in other inputs only. But how short is the short-run ? It depends on the following :

It should be

(1) sufficiently short so that the entrepreneur is unable to alter the levels of his fixed inputs;

(2) short enough so that the shape of the production function does not alter due to technological improvements; and

(3) long enough to allow the completion of the necessary technical process.

The short-run version of the production function would then appear as :

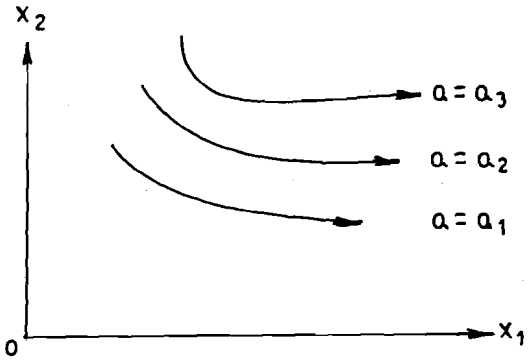
$$Q = f(L, \bar{K}) \qquad \text{or} \qquad Q = f(x_1, x_2^0)$$

However, it is a time concept but not a definite time-period , for it varies with types of activities. For agricultural activities it could mean a year or even a season whereas for industrial plants it could mean even 3-5 years, because of the long gestation period between planning and execution.

Long run on the other hand, is the period during which all the inputs are variable.

Isoquant

It is the locus of all input combinations yielding a given output level, called the equal output curve.



* Downward sloping and convex to the origin
* Higher the isoquant, the larger is the output
* They do not intersect

Figure 2.4

If x_1 and x_2 (say, labour and capital) become perfect substitutes, however, the isoquant would then be a straight line (Figure 2.5). When no substitution is possible, the isoquants would have the shape given in Figure 2.6.

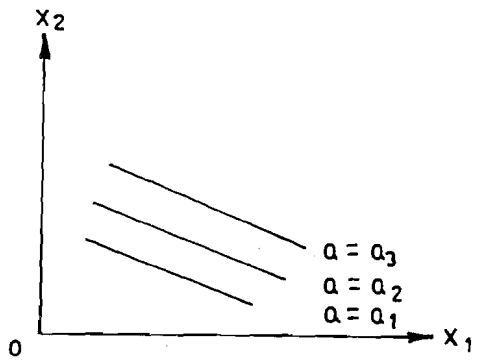


Figure 2.5

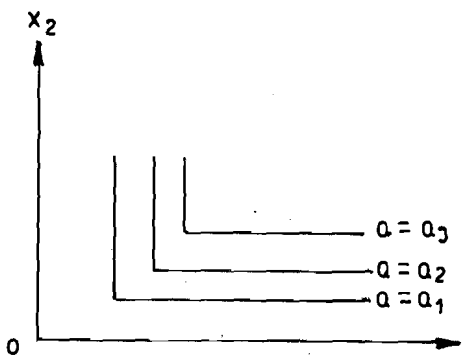


Figure 2.6

A short-run production function like $Q = f(x_1, x_2^0)$ could be as shown in Figure 2.7.

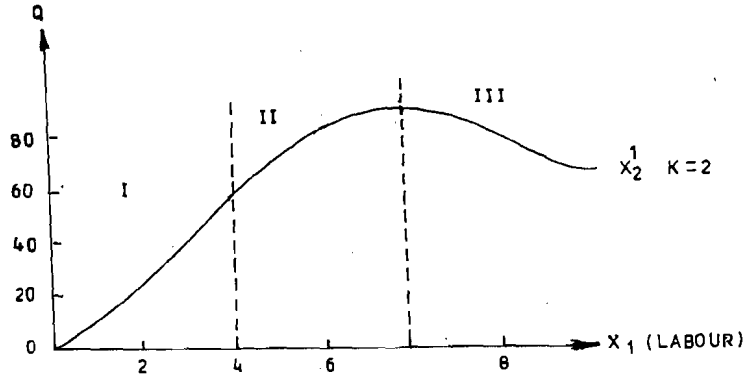


Figure 2.7

At first, it is convex below and then concave from below. This is because of the operation of Law of Variable Returns, i.e. in phase I as more and more of labour is employed production increases at an increasing rate. In phase II it, however, increases at a decreasing rate and finally leads to decrease in total production.

This is also called the *Total Productivity Curve* of labour (input 1). From this, we can derive average and marginal productivity curves as follows :

$$AP = \frac{Q}{x_1} = \frac{f(x_1, x_2^0)}{x_1}$$

$$MP = \frac{\partial Q}{\partial x_1} = f_1(x_1, x_2^0)$$

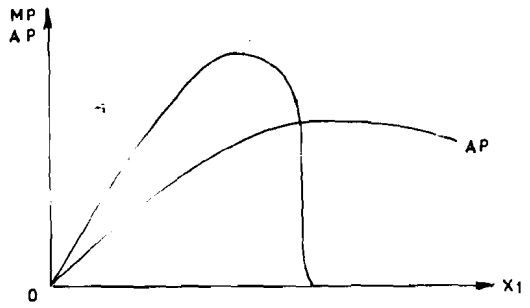


Figure 2.8

Both AP and MP increase at first as more and more x_1 is employed and then decline. The MP curve reaches its maximum at a lower input level than the AP curve. The MP curve intersects the AP curve at the latter's maximum point.

$$\frac{\partial AP}{\partial x_1} = \frac{x_1 f_1(x_1, x_2^0) - f(x_1, x_2^0)}{x_1^2} = 0$$

$$f_1(x_1, x_2^0) = \frac{f(x_1, x_2^0)}{x_1}$$

i.e. $MP = AP$ at a point of maximum AP.

2.3.2 Supply Curves

The supply curves is defined for :

(a) Very short period

(b) Short run

(c) Long run

Very Short Period

A very short period is one during which output level cannot vary. The entrepreneur sells, in other words, a given stock of the product say, Q^0 and since this level of output is already produced, the MC of any output less than Q^0 is zero. And for output levels greater than Q^0, the MC is infinity because output cannot simply be increased. The MC curve is a vertical line at this point and since the output of each firm is fixed the aggregate supply of the product is also given and does not depend on the price.

The supply curve is a vertical line and its distance from the price axis would give us the sum of the output of the individual firms.

$$OS = OQ_1^0 + OQ_2^0 + \ldots + OQ_n^0$$

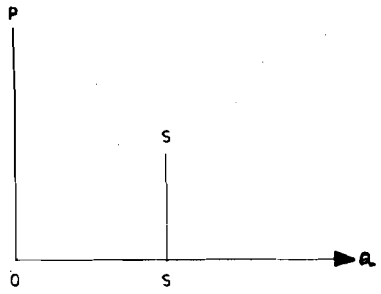


Figure 2.9

Short Run

The supply function of perfectly competitive firm states the quantity it will produce as a function of (or in responses to) market price. The horizontal coordinate of a point on the rising portion of the MC curve corresponding to a given price is the quantity that the firm would produce and supply at that price (given by the first-order condition of profit maximisation).

In other words, the firms short-run supply curve is given by that portion of the short-run MC curve which lies above the AVC curve.

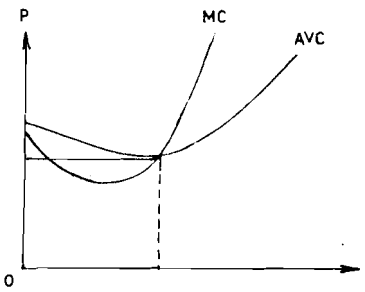


Figure 2.10

For prices below the AVC, quantity supplied would be zero.

$Si = Si(P)$ for $P \geq$ Min . AVC

$Si = 0$ for $P <$ Min . AVC

The aggregate supply curve is the sum of individual supply curves. Thus,

$$S = \sum_{i=1}^{n} Si(P) = S(P)$$

Long Run Relationship

Since all costs are variable in the long-run, there is no fixed costs here

$$TC = f(Q, K)$$

where, Q = output, and K = plant size.

TC changes as K changes and as such the long run cost function consists of a family of short-run cost functions as shown in Figure 2.11.

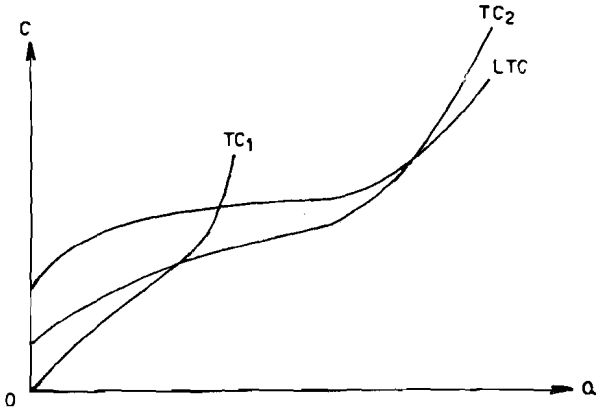


Figure 2.11

The long-run AC curve is the envelope of the short-run AC curves as shown in Figure 2.12.

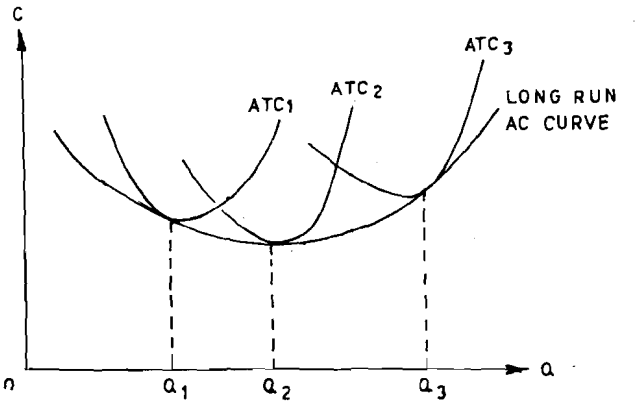


Figure 2.12

Once we reach output Q_1, i.e. reach the minimum point ATC, it would be uneconomical to continue to operate with the same plant and technology for it would make us more along the rising phase of the cost curve. However, if we expand elasticity or operate with a larger plant we would then be moving along the following phase of the relevant cost curve, i.e. ATC_2. Similar arguments hold for output levels, higher and substantially higher than Q_2 and Q_3, Q_4 etc.

2.3.3 Cost Curves

The general determinants of costs of production are output level, factor prices, factor efficiency or productivities and technology. However, of all the relationships between costs and its determinants, cost-output relationship assumes greater significance because it changes faster and more often and thus, becomes important in decision making. Also once this relationship is determined, future costs of production at different levels of output may be obtained by incorporating adjustments in wages, other input prices, efficiency factors and the like. We shall consider the cost output relationship for the short and long runs separately.

Short-run Relationship

In the short-run, the cost output relationship relate to a fixed plant or particular scale of operation.

(a) ATC, AVC and MC fall at first then remain constant for a while and then begin to rise as output rises.

(b) MC changes at faster rate than AVC. Therefore, the MC reaches its minimum at a higher level of output than does AVC.

(c) ATC falls for a longer range of output than AVC. Therefore, ATC reaches its minimum at a higher level of output than does AVC.

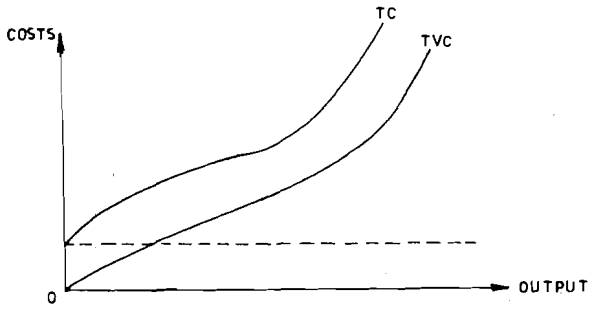


Figure 2.13

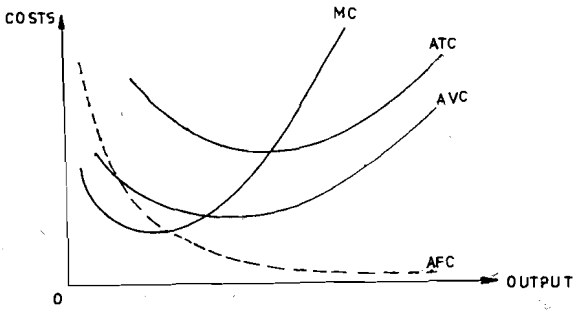


Figure 2.14

(d) $AVC = MC$ when AVC is the minimum.

(e) $ATC = MC$ when ATC is the minimum.

(f) ATC, AVC and MC are U-shaped (Figure 2.14).

(g) AFC is a rectangular hyperbola. Once the minimum ATC point is reached for any given plant size, the optimum output is obtained. Beyond this, the law of diminishing returns sets in and AVC rises faster.

2.3.4 Breakeven Analysis

Often a firm has only a limited information on its revenue and cost functions and in such cases, the breakeven analysis could be a good approximation to the profit maximising principle. It might be useful also in situations where a tender is to submitted within a short-time.

$$BEQ = \frac{TFC}{P - AVC}$$

where,

BEQ = breakeven quantity of output,

TFC = total fixed cost,

AVC = average variable cost, and

P = unit price.

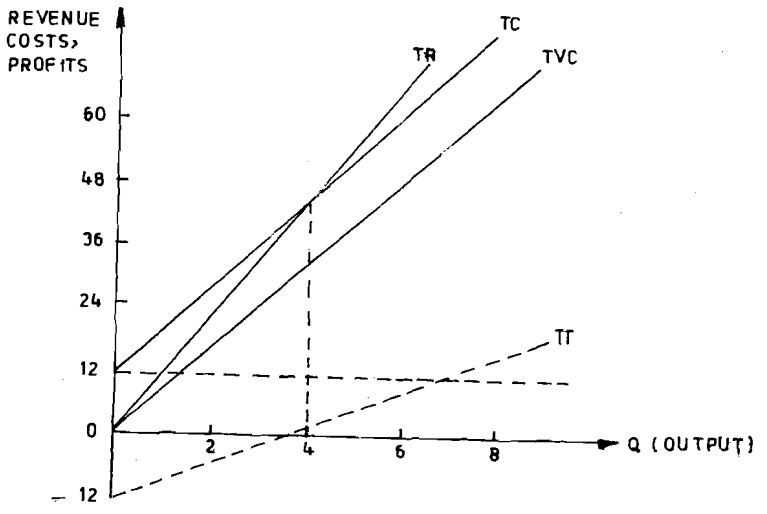


Figure 2.15

The breakeven point is defined as the point where profit $\Pi = 0$, i.e. total revenue equals total costs. In what follows, the breakeven analysis is carried out under linear and non-linear assumptions.

Profit and Breakeven Analysis for the Linear Case

Supposing, $TR = 10Q$ and $TC = 12 + 7Q$.

Then, profits, $\Pi = TR - TC = 10Q - 12 - 7Q$

So, given the linear total revenue and total cost functions the profit function would also be linear and the breakeven point is given by

$$\Pi = TR - TC = 0 = 3Q - 12 \text{ or } 3Q = 12, \text{ i.e. } Q = 4 \text{ units.}$$

Alternatively. *BEQ* or the breakeven output can be given as follows :

$$\frac{TFC}{P - AVC} = \frac{12}{10 - 7} = 4 \text{ units}$$

Here, $(P - AVC)$ is called the average contribution and the gap between *TR* and *TVC* is called the total contribution.

Here, profits Π, is a monotonically increasing function of output, i.e. greater the output, the larger the profit and vice-versa. Profits are negative when output is zero (because of the fixed costs) and small *TC* curve is above the *TR* curve for outputs upto $Q = 4$ indicating losses beyond 4 units of output, however, quite the opposite holder, i.e. the firm is making profits. The gap between *TR* and *TVC* is called the total contribution which is always positive. The contribution per unit of output is called the average contribution.

In our example, $TFC = 12$ and $TVC = 7Q$

$$AVC = \frac{TVC}{Q} = \frac{7Q}{Q} = 7, \text{ and}$$

$$P = \frac{TR}{Q} = \frac{10Q}{Q} = 10$$

SAQ 2

(a) What do you understand by a production function ?

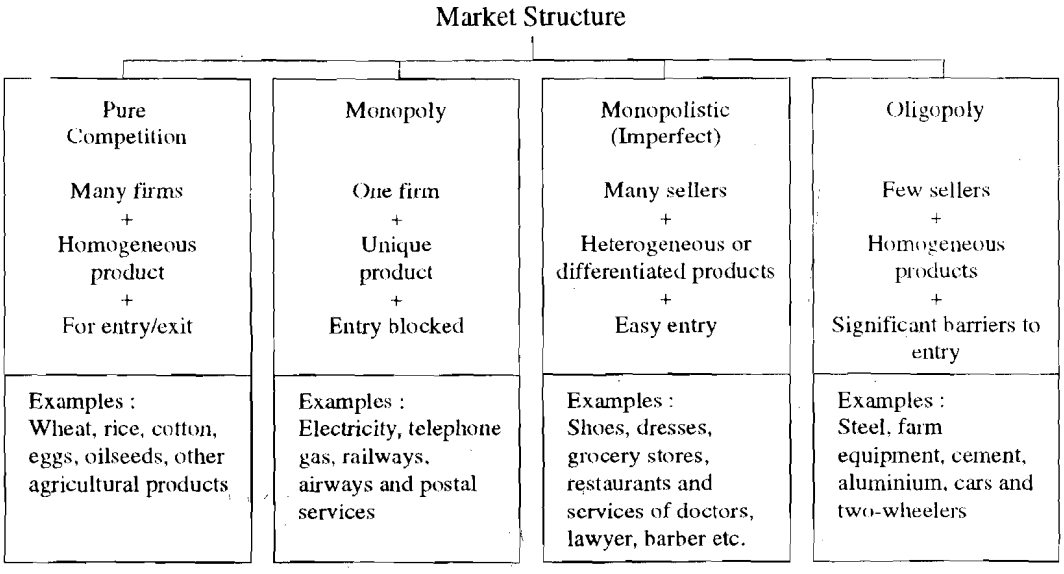
(b) Distinguish between the short-run and the long-run and their significance for production and costs.

(c) What is meant by breakeven analysis ? How is it useful ?

(d) Why is a supply curve positively sloped, in general ?

2.4 MARKET STRUCTURE

Markets are distinguished on the basis of the degree of competition in the market for goods/service. By a market, we mean all individuals/households and firms willing and able to buy or sell a particular/service.



2.4.1 Pricing and Output Determination under Pure Competition

A market which is pure competitive, has a large number of buyers and sellers, a homogeneous product and free entry/exit. Each seller/buyer is insignificant in relation to the market, as what he sells or buys is only a small fraction of the enormously large output. However, all of them taken together (the "invisible hands") determine the market price. The sum of the individual demand curves would create the market. Industry demand curve and the sum of the individual supply curves would give us the market clearance. The market price is determined by the intersection of the aggregate demand curve and the aggregate supply curve. Once this price is determined, an individual seller/buyer can sell/buy any amount of the product at the price. Each firm, therefore, would be facing an infinitely elastic (horizontal) demand curve at the price determined by the industry. Firms, however, do not have identified or equally efficient factors of production and as such have differing cost functions. In the short-run, we tend to have the following four situations into which different firms may fall :

(a) Profit making firms,

(b) Breaking-even firms,

(c) Inefficient but operating firms (loss making firms), and

(d) Inefficient and closed down firms (close-down firms).

Diagrammatically, these four situations are represented in Figure 2.16.

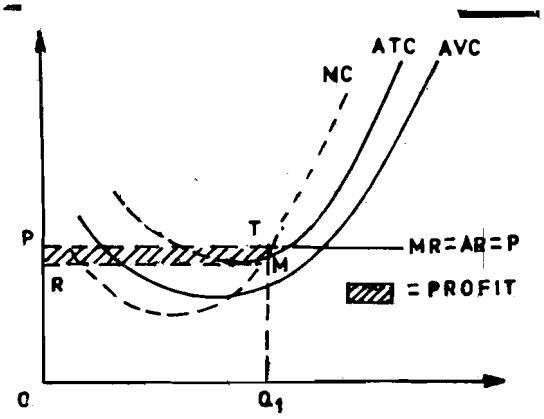


Figure 2.16 (a) : Profit Making Firms

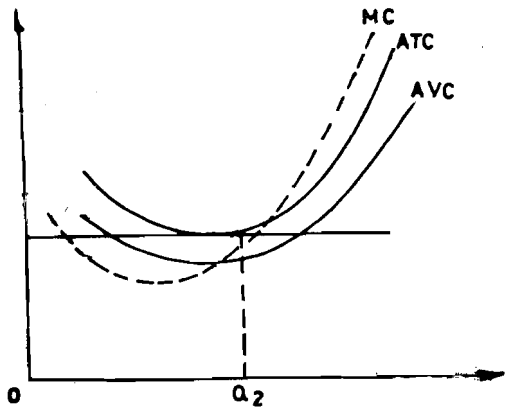


Figure 2.16 (b) : Breaking-even Firms

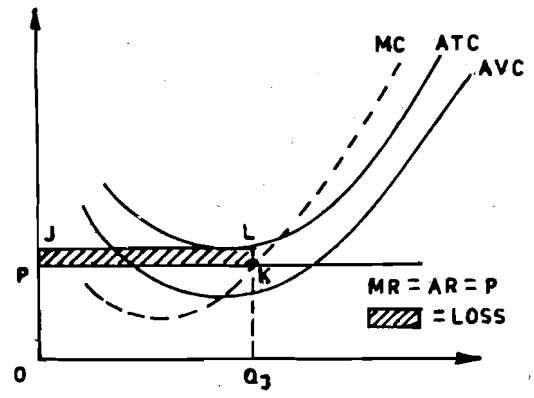


Figure 2.16 (c) : Loss Making Firms

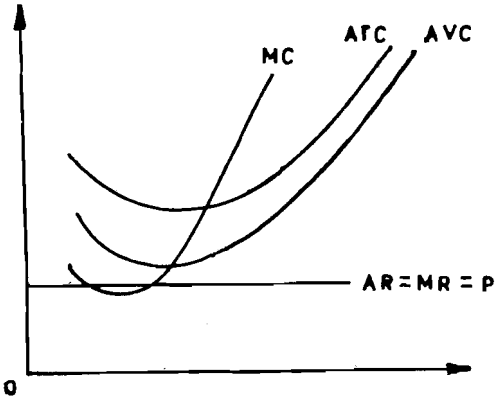


Figure 2.16 (d) : Close-down Firms

Numerical Example

Suppose aggregate demand is given by $Q_{dd} = 20 - 0.4P$, (2.8)

and aggregate supply by $Q_{ss} = 5 + 0.8P$ (2.9)

The equilibrium price in the market would be determined when market demand equals market supply, i.e. Eq. (2.8) = Eq. (2.9).

Therefore, $20 - 0.4P = 5 + 0.8P$

$15 = 1.2P$ or Equilibrium Price, $P = 12.5$ (2.10)

Now, industry output at this price $P = 12.5$ is obtained by substituting the price in either demand or supply, thus,

$$Q = 20 - 0.4(12.5)$$

$$Q = 20 - 5 = 15 \text{ units}$$

Therefore, the Equilibrium price = 12.5, and

the Equilibrium industry output = 15 units.

If the total cost function of a particular firm is given by

$$TC = 10 - 2Q_1 + 4Q_1^2 \tag{2.11}$$

The supply function of this profit maximizing firm would be

$$MC = MR = P$$

$$MC = \frac{dC}{dQ} = -2 + 8Q_1 = P, \text{ i.e. } Q_1 = \frac{1}{8}(P + 2).$$

Assuming of course, that is profitable for the firm to operate rather than close down its plant. This could be checked once we find the shut-down or close-down prices (in the short and the long-run) of the firm.

Close-down price in the short-run is the Min. *AVC*

$$TVC = 2Q_1 + 4Q_1^2$$

$$AVC = 2 + 4Q_1$$

Since this is linear function, the *AVC* here has no minimum. The short-run supply function Q_1^S would, therefore, be given by its unrestricted supply function.

$$Q_1^S = \frac{1}{8}(P + 2) = \frac{1}{8}(12.5 + 2)$$

$$= \frac{1}{8}(14.5) = 1.8125 \text{ units}$$

The firm would produce 1.8125 units and sell it at price $P = 12.5$.

The total revenue = $(12.5) \times (1.8125) =$ Rs. 22.66

The total cost = $20 - 2(1.8125) + 4(1.8125)^2 = 20 - 3.6250 + 12.96 = 29.34$.

Losses incurred by the firm = $TC - TR = 29.34 - 22.66 = 6.68$

The loss, however, is less than the fixed costs, i.e. $(6.68 < 20)$

Now, what happens in the long-run ?

The equilibrium output in the long-run is determined by the firm's minimum *ATC* .

$$ATC = \frac{20}{Q_1} - 2 + 4Q_1$$

$$\frac{d(ATC)}{dQ_1} = -\frac{20}{Q_1^2} + 4 = 0 \quad \text{or } Q_1 = 2.2$$

$$\frac{d^2(ATC)}{dQ_1^2} = \frac{Q_1^2(0) + 20(Q_1)}{(Q_1^2)^2} = \frac{40Q_1}{(Q_1)^4} = \frac{40}{(Q_1)^3}$$

Here, we get, $\quad \frac{40}{(2.2)^3} > 0$

Thus, *ATC* is minimum at $Q_1 = 2.2$ and it equals to

$$\text{minimum } ATC = \frac{20}{2.2} = 2 + 4(2.2) = 19.6$$

i.e. the firm would supply positive output in the long-run if and only if the price of its product is more than 19.6.

However, since the price ruling in the market is only 12.5 the firm would leave this industry in the long run.

2.4.2 Monopoly

In this case where the market is characteristic by a single producer producing a unique product having no substitute and entry (and exit) being prohibited, the firm itself constitutes the industry. A pure monopoly market may fall into either of the following two categories :

Simple Monopoly	Discriminating Monopoly
The firm charges an uniform price for its products for all its consumers.	The firm charges different prices for a given product from different sets of consumers (or for different units of its product from the same consumer).

Single Monopoly

Since there is no difference between the industry and the firm, the demand curve facing the monopoly firm is the same as for the one faced by the industry, i.e. downward sloping demand curve meaning that more could be sold only at a lower price and vice-versa. The firm is, therefore, a price-maker. Once the market demand is given, the monopolist can either set the price or the output. If he fixes the price, this output is then fixed by the market demand or alternatively, if he fixes the output, the price is determined by the consumers demand.

The cost curves of a monopoly firm would be of the usual shapes as discussed before, for the factors of production have to be hired by the monopoly producer in the same way as a competitive firm does. Figures 2.17 (a), (b) and (c) illustrate the possible equilibrium position for a monopolist.

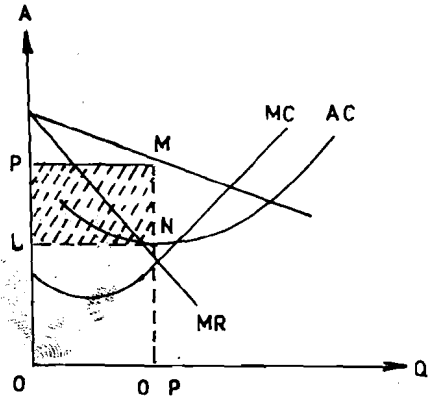


Figure 2.17 (a) : Profit Making Monopolist

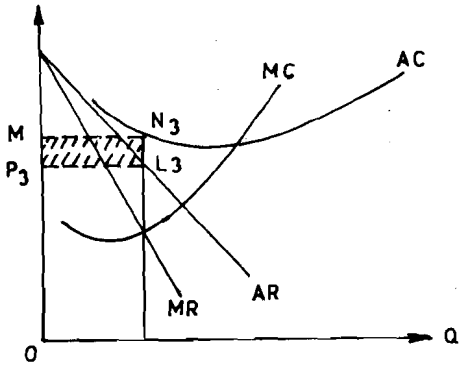


Figure 2.17 (b) : Breaking-even Monopolist

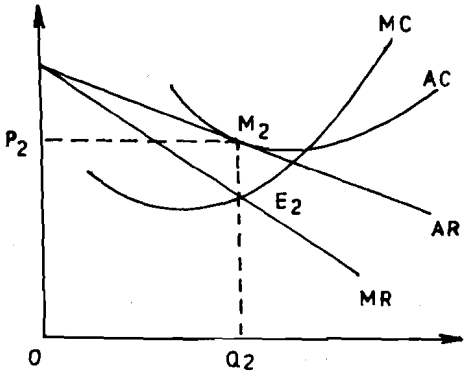


Figure 2.17 (c) : Loss Making Monopolist

The monopolist's profits are maximum at a point where $MC = MR$ (recall the first order or necessary condition) and the MC curve cuts the MR curve from below (recall the second order or sufficient condition), or MC should be rising at that point. Now, in Figure 2.17 (a), these conditions are not at point E, and the resulting equilibrium output is OQ^* and the equilibrium price is O^*. Here, the monopolist earnings a profit equalling the rectangle P^*MNL. A change in either the demand

curves or in cost curves or in both would bring about a change in the equilibrium price and output. An increase in demand resulting in upward shift in *AR* and *MR* curves, other things remaining the same, would cause an increase both in price and quantity of output; whereas an increase in supply leading to downward shifting of cost curve would, other things remaining the same, cause an increase in output but a fall in price.

What holds true in the short-run also holds in the long-run since there is neither entry nor exit in the industry.

Figures 2.17 (b) and (c) depict breakeven and loss-making situations respectively. The breakeven equilibrium position could also exist in the long-run, but losses are possible only in the short-run as its exit cannot totally be ruled out in the long-run if losses continue to persist.

SAQ 3

(a) What is meant by consumers rationality and what economic role do they play in market ?

(b) What are the factors that govern producers behaviour with respect to output and price ?

(c) What do you mean by market ?

(d) Name the different types of markets and give examples for each of the them.

(e) Why do markets sometimes fail to perform ? Is intervention always justified ?

(f) Explain how the output and the price are determined in a perfectly competitive market ?

(g) Distinguish between a simple monopoly and a discriminating monopoly.

2.5 SUMMARY

Let us briefly summarise what we have studied so far. We began with consumers and saw how they generate demand given their incomes and various goods with the respective prices. We then went on to study the behaviour of producers, their supply response, cost of production, breakeven points etc. Finally, we brought in both the consumers and the producers to the market place and saw how output and pricing decisions are made.

Consumers

Consumers basically maximise satisfaction or utility and therein lies their rationality. In doing so, they weigh alternative choices of bundles of goods and services given their budget (income) and the prices of these goods. The nature of the goods, their demand elasticities, the proportion of income spent on such goods also play a significant role. In the long run, however, several other factors such as migration, changes in tastes preferences etc. may also have to be considered.

Producers

We have seen that a rational producer maximise profits or the difference between his revenue and costs. Therefore, the output quantity that he produces and sells, the price at which he sells the output, the cost at which he produces (both fixed and variable costs) become relevant and crucial for him. While in the short-run, the fixed cost remain constant and begin to spread over wider and wider range as output expands, in the long-run all costs become variable including plant and equipment due to wear and tear, technological obsolescence etc.

Issue like costs, supply breakeven point have been dealt with.

Markets

Here, consumers and producers are brought together in the form of demand and supply curves and the behaviour of the market is explained in terms of output and

price determination while different types of market and their features are stated, only two extreme forms, viz. perfect competition and monopoly markets have been analysed.

It is true that markets generally perform well in terms of bringing about an equilibrium between (clearing) demand and supply positions, by an invisible hand as it were. It, however, fails at times resulting in either excess demand (shortage) or excess supply (glut). The great depression of 1929-1933 is a classic case of market failure. In such cases, government intervention is called for by way of some legislative measures, subsidies, taxes, prices or quantity controls etc. to make up for the market imperfections like monopoly and unfair practices, external cost like harmful effects of poor working conditions on workers, health damages the environment etc. Markets should not be overregulated, for they will simply die. They should not also be let loose, for they may go haywire and bring chaos.

2.6 ANSWERS TO SAQs

Refer the relevant preceding text in the unit or other useful books on the topic listed in the section "Further Reading" to get the answers of the SAQs.