

FIRM'S BEHAVIOUR

BASIC CONCEPTS

Firm:

Firm is a business unit which combines, co-ordinates, supervises and manages various factors of production to produce goods and services, sells these goods & services in the market and is responsible for profit or loss.

Firm's equilibrium:

The best possible situation within the given conditions for a firm, i.e. maximum profit in case of profit and minimum loss in case of loss, is called firm's equilibrium.

Firm's behaviour:

The behaviour of a firm to avail its equilibrium is called firm's behaviour.

Firm's objective:

The ultimate objective of a firm is the maximization of profit within the given constraints.

The basic determinants of profit are revenue and cost of production. Symbolically,

$$\pi = R - C$$

If the difference between revenue and cost is higher, the profit will be higher and vice versa. Thus a rational firm is always in search of maximization of revenue and minimization of cost.

The above discussion reveals that we must be clear about the various aspects of revenue and cost to understand a firm's behaviour. Accordingly we must be clear about the revenue curves and cost curves to explain equilibrium diagrammatically.

REVENUE ANALYSIS

We shall first explain the basic concepts of revenue and then we shall draw different revenue curves.

Total Revenue (TR):

It is the total receipt of a firm from the sale of a specific quantity of its product at a specific price over a particular period of time. Symbolically,

$$TR = P \cdot Q$$

For example, if a firm sells 10 units of its product at the rate of Rs.5/- per unit, its total revenue will be Rs.50.

Average Revenue (AR):

It is the per unit receipt of a firm from the sale of a specific quantity of its product during a particular period of time. Symbolically,

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

For example, if total revenue from the sale of 10 units is Rs.50 then per unit receipt, i.e. average revenue is Rs.5, it reveals that $AR = P$.

Marginal Revenue (MR):

Net addition to the total revenue due to the sale of an additional unit of a firm's product during a specific time period is called marginal revenue. Symbolically,

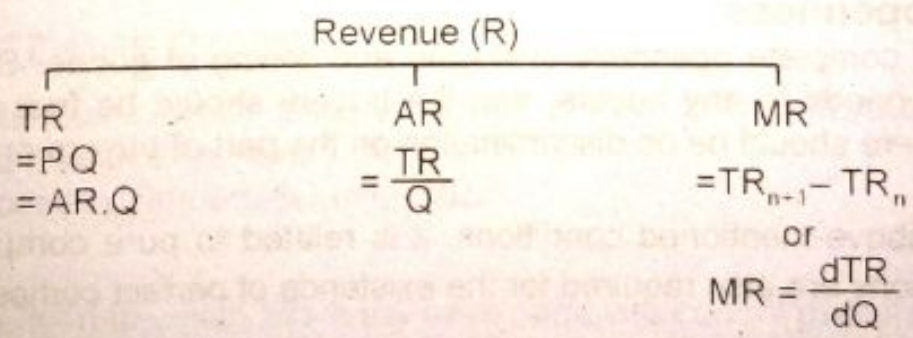
$$MR = TR_{n+1} - TR_n \quad \text{or}$$

$$MR = \frac{dTR}{dQ}$$

For example, if total revenue from the sale of 10 units is Rs.50 and the firm sells 11th unit due to which total revenue increases upto Rs.54, now

$$\begin{aligned} MR &= TR_{n+1} - TR_n \\ &= 54 - 50 \\ &= 4 \end{aligned}$$

Various concepts of revenue can be summarized as under:



DERIVATION OF REVENUE CURVES UNDER PERFECT COMPETITION

Revenue curves are derived on the basis of nature of market w.r.t. competition. We have three categories of market in this regard, i.e. perfect competition, monopoly and imperfect competition.

PERFECT COMPETITION

The concept of perfect competition was first introduced by **Adam Smith** in his well-known book "Wealth of Nations" in 1776¹. This concept got popularity and recognition after **Frank Knight's** book, "Risk Uncertainty and Profit" in 1921.

Definition:

- i. "A market in which there is complete absence of direct competition among economic groups, is called perfect competition. ²" (**Ferguson**)
- ii. "Perfect competition prevails when the demand for the output of each producer is perfectly elastic. This entails that number of sellers and buyers is so large that their individual action cannot influence the price." (**Mrs. Joan Robinson**)

Comprehensively speaking:

"Perfect competition is a market situation in which there exists the same price for all units of the given good or service in a given time period. Hence each and every firm or a buyer is price-taker and not price-maker"³.

This situation appears when we observe the following conditions.

CONDITIONS / ASSUMPTIONS

1. Homogeneity:

Product of all sellers is identical in quality, size, design, colour, packing etc.

2. Large number of buyers & sellers:

The number of buyers and sellers must be so large that none of them can influence the price and output in the market. Thus they are "price-takers" and not "price-makers".

3. Freedom of entry and exit:

The firms should be free to enter or leave the business.

4. Complete openness:

There should be complete openness in buying and selling of goods. Sellers should be free to sell their goods to any buyers, and the buyers should be free to buy from any sellers. Hence there should be no discrimination on the part of buyers or sellers.

5. Perfect knowledge:

Both buyers and sellers have perfect knowledge of market conditions. Hence no one can dare to influence the price.

6. Perfect mobility:

There exists perfect mobility of goods and factors. Goods are free to move to those places where, they can fetch higher prices. Factors can also move from a low-paid area or occupation to a high-paid area or occupation.

7. Perfect elasticity of factors:

Factors of production are perfectly elastic and they are infinitely available at the prevailing price.

8. Absence of transport cost:

Transport cost is to be assumed nil for the existence of perfect competition. If transport cost is added to the price of the product, even a homogenous good will have different prices.

MONOPOLY

- i. "Pure monopoly is the form of market organization in which there is a single firm selling a commodity for which there are no close substitutes." (D.Salvatore)
- ii. "Pure or absolute monopoly exists when a single firm is the sole producer of a product for which there are no close substitutes." (Mc Connell)

Comprehensively speaking:

"Monopoly is a market situation in which a single firm has complete control over the production and supply of a good or service and there is no close substitute available in the market. Hence the pure monopolistic firm is price-maker and not price-taker."⁵

IMPERFECT COMPETITION

"It is a market situation in which there is neither monopoly nor perfect competition but a firm operates in between these two extremes."⁶

There are three cases of imperfect competition.

(a) Duopoly:

It is a market situation in which two firms have complete control over the production and supply of a good or service and no close substitute is available in the market.

(b) Oligopoly:

It is a market situation in which a few firms (3 to 20) have complete control over the production and supply of a good or service. The product may be either homogeneous or differentiated.

(c) Monopolistic competition:

- i. "Monopolistic competition refers to the market organization in which there are many firms selling closely related but not identical commodities." (D.Silvatore)
- ii. "Monopolistic competition is found in that industry when there is large number of small sellers, selling differentiated but close substitute products." (Joe & Bain)
- iii. **Comprehensively speaking,**
"Monopolistic competition is a market situation in which a reasonably large number of firms (i.e 21 – 70) produce similar but not identical products."⁷

After a brief but comprehensive discussion on the nature of market, we derive revenue curves under different categories of market.

DERIVATION OF REVENUE CURVES UNDER PERFECT COMPETITION

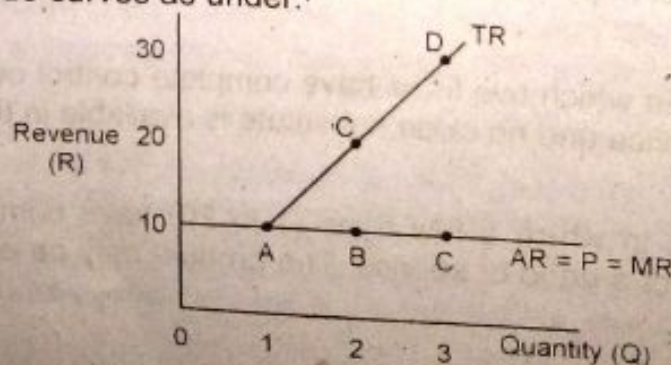
Perfect competition is a market situation in which there exists the same price for all units of the given good or service in a given time period. It means that perfect competition is a market organization in which both the stake holders i.e. sellers and buyers are price-takers and not price-makers. What ever the product is sold by the seller or purchased by the buyer, price remains the same and no individual action by either side can influence the price of the product.

We plot the revenue curve under perfect competition with the help of the following revenue schedule of an individual perfectly competitive firm.

Quantity Sold	Price	TR	MR	AR
1	10	10	10	10
2	10	20	10	10
3	10	30	10	10

In the given table, price remains the same for all units of quantity sold which leads to the same AR and MR.

Now we plot the revenue curves as under:



The diagram shows that $AR = P = MR$ in perfect competition which results in a parallel $AR = P = MR$ curve. It indicates that price remains the same for all units sold. Moreover, TR curve is a straight line with positive slope which shows that as price increases, TR also increases.

DERIVATION OF REVENUE CURVES UNDER MONOPOLY AND IMPERFECT COMPETITION

Monopoly:

It is a market situation in which a single firm has complete control over the production and supply of the product. Moreover, there is no close substitute available in the market. Hence a firm is price-maker and not price-taker.

Imperfect competition:

It is a market situation in which a firm neither operates in monopoly nor in perfect competition but it operates in between these two extremes. Moreover, the firm produces similar but not identical product, i.e. differentiated but close substitute product.

We have three cases of imperfect competition.

- (a) Duopoly;
- (b) Oligopoly; and
- (c) Monopolistic competition.

(Details have already been discussed)

In both the market situations, i.e. monopoly and imperfect competition, the firm can influence the price by its individual action. In case of monopoly, the firm has the strongest hold and it is in a position to bring about a remarkable change in price. In case of imperfect competition, a firm loses its grip to influence the price as the number of firm's increases. When the firm works under perfect competition, the grip over price is entirely lost and it cannot bring even a slight change in price by its individual activity.

In all market situations, a firm is always in search of equilibrium, i.e. maximization of profit in case of profit and minimization of loss in case of loss. We know that $\pi = TR - TC$.

Within the given cost of production, a firm can enjoy maximum profit if TR is maximum.

Now $TR = P \cdot Q$; it can be increased either by increasing price of the good or by increasing the sale of the product. If the firm increases price, it can lose its customers and hence it may be at losing end. On the other hand, if it increases its sale by decreasing the price, its TR may increase which results in maximum profit. Thus general practice of a firm working under monopoly or imperfect competition is to decrease the price to avail maximum profit. Now if the firm decreases price of its product, AR decreases because $AR = P$ and correspondingly MR also decreases. It should be noted here that decreasing rate of MR is double than the decreasing rate of AR. It means that MR curve is two times steeper than that of AR curve. In other words, the slope of MR curve is double than that of the slope of AR curve.

Firm's Behaviour

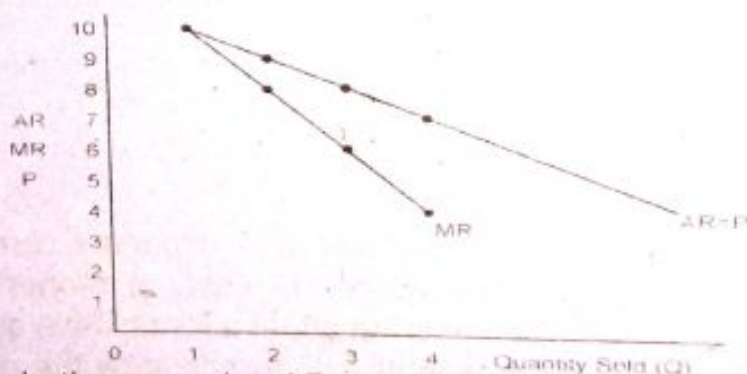
All it is explained in the following table:

Quantity Sold (Q)	Price (P)	Total Revenue (TR)	Average Revenue (AR)	Marginal Revenue (MR)
1	10	10	10	10
2	9	18	9	8
3	8	24	8	6
4	7	28	7	4

The table shows that when price decreases, quantity sold increases due to higher demand. As a result, AR decreases but MR decreases two times sharply which indicates that slope of MR is double to the slope of AR. For example, when quantity sold increases from 1st unit to 2nd unit, slope of AR = $\frac{\Delta AR}{\Delta Q} = 1$ and slope of

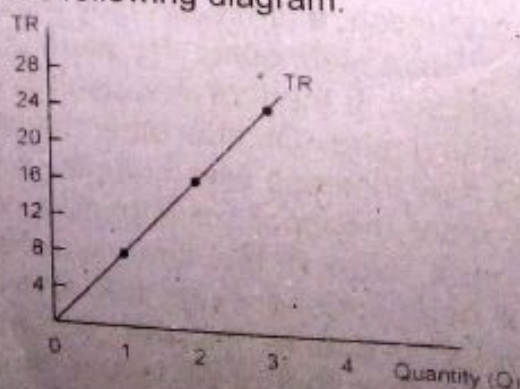
$$MR = \frac{\Delta MR}{\Delta Q} = 2$$

Now we plot a diagram in which we derive the revenue curves in the light of given information.



In the given diagram, both curves, i.e. AR and MR have negative slope. AR curve is also known as demand curve because it indicates the relationship between price and quantity demanded ($P = AR$). Moreover, MR curve is two times steeper than AR curve which confirms that slope of MR is double to the slope of AR curve.

Now we derive T.R curve in the following diagram.



In all the numerical examples, we observe