

Price Determination under Oligopoly

Oligopoly is that market situation in which the number of firms is small but each firm in the industry takes into consideration the reaction of the rival firms in the formulation of price policy. The number of firms in the industry may be two or more than two but not more than 20. Oligopoly differs from monopoly and monopolistic competition in this that in monopoly, there is a single seller; in monopolistic competition, there is quite a larger number of them; and in oligopoly, there are only a small number of sellers.

CLASSIFICATION OF OLIGOPOLY:

The oligopolistic industries are classified in a number of ways:

(a) Duopoly: If there are two giant firms in an industry it is called duopoly. Duopoly is further classified as below:

- (i) Perfect or Pure Duopoly:** If the duopolists in an industry are producing identical products it is called perfect or pure duopoly.
- (ii) Imperfect or Impure Duopoly:** If the duopolists in an industry are producing differentiated products it is called imperfect or impure duopoly.

(b) Oligopoly: If there are more than two firms in an industry and each firm takes consideration the reactions of the rival firms in formulating its own price policy it is called oligopoly. Oligopoly is further classified as below:

- (i) Perfect or Pure Oligopoly:** If the oligopolists in an industry are producing identical products it is called perfect or pure oligopoly.
- (ii) Imperfect or Impure Oligopoly:** If the oligopolists in an industry are producing differentiated products it is called imperfect or impure oligopoly.

Types of Market Structures				
Structure	No. of Producers & Degree of Product Differentiation	Part of economy where prevalent	Firm's degree of control over price	Methods of Marketing
Perfect competition	Many producers, Identical products	Financial markets, & Some agricultural products	None	Market exchange or auction
<u>Imperfect competition:</u>				
Monopolistic competition	Many producers, Many real or perceived differences in product	Retail trade (Gasoline, PCs, etc.)	Some	Advertising and Quality rivalry, Administered prices
Oligopoly	Few producers, No differences in product.	Steel, chemicals, etc.		
	Few producers, Some differentiation of products	Autos, aircraft, etc.		
Monopoly	Single producer, Product without close substitutes	Local telephone, electricity, and gas	Considerable but usually regulated	Advertising and Service promotion

CAUSES OF OLIGOPOLY:

1. **Economies of Scale:** The firms in the industry, with heavy investment, using improved technology and reaping economies of scale in production, sales, promotion, etc, will compete and stay in the market.
2. **Barrier to Entry:** In many industries, the new firms cannot enter the industry as the big firms have ownership of patents or control of essential raw material used in the production of an output. The heavy expenditure on advertising by the oligopolistic industries may also be a financial barrier for the new firms to enter the industry.
3. **Merger:** If the few firms in the industry smell the danger of entry of new firms, they then immediately merge and formulate a joint policy in the pricing and production of the products. The joint action of the few big firms discourages the entry of new firms into the industry.
4. **Mutual Interdependence:** As the number of firms is small in an oligopolistic industry, therefore, they keep a strict watch of the price charged by rival firms in the industry. The firm generally avoid price war and try to create conditions of mutual interdependence.

CHARACTERISTICS OF OLIGOPOLY:

1. Every seller can exercise an important *influence on the price-output policies* of his rivals. Every seller is so influential that his rivals cannot ignore the likely adverse effect on them of a given change in the price-output policy of any single manufacturer. The rival consciousness or the recognition on the part of the seller is because of the fact of interdependence.
2. The demand curve under oligopoly is indeterminate because any step taken by his rivals may change the demand curve. It is *more elastic than under simple monopoly and not perfectly elastic as under perfect competition.*
3. It is often noticed that there is *stability in price* under oligopoly. This is because the oligopolist avoids experimenting with price changes. He knows that if raises the price, he will lose his customers and if he lowers it he will invite his rivals to price war.

EFFECTS OF OLIGOPOLY:

1. ***Small output and high prices:*** As compared with perfect competition, oligopolist sets the prices at higher level and output at low level.
2. ***Restriction on the entry:*** Like monopoly, there is a restriction on the entry of new firms in an oligopolistic industry.
3. ***Prices exceed Average Cost:*** Under oligopoly, the firms fixed the prices at the level higher than the AC. The consumers have to pay more than it is necessary to retain the resources in the industry. In other words, the economy's productive capacity is not utilised in conformity with the consumers' preferences.
4. ***Lower efficiency:*** Some economists argued that there is a low level of production efficiency in oligopoly. There is no tendency for the oligopolists to build optimum scales of plant and operate them at the optimum rates of output. However, the Schumpeterian hypothesis states that there is high tendency of innovation and technological advancement in oligopolistic industries. As a result,

- the product cost decreases with production capacity enhancement. It will offset the loss of consumer surplus from too high prices.
5. **Selling Costs:** In order to snatch markets from their rivals, the oligopolistic firms may engage in aggressive and extensive sales promotion effort by means of advertisement and by changing the design and improving the quality of their products.
 6. **Wider range of products:** As compared with pure monopoly or pure competition, differentiated oligopoly places at the consumers' disposal a wider variety of commodities.
 7. **Welfare Effect:** Under oligopoly, vide sums of money are poured into sales promotion to create quality and design differentiations. Hence, from the point of view of economic welfare, oligopoly fares fairly badly. The oligopolists push non-price competition beyond socially desirable limits.

PRICE DETERMINATION UNDER OLIGOPOLY:

The price and output behaviour of the firms operating in oligopolistic or duopolistic market condition can be studied under two main heads:

1. Price and Output Determination under Duopoly:

- (a) If an industry is composed of two giant firms each selling ***identical or homogenous*** products and having half of the total market, the price and output policy of each is likely to affect the other appreciably, therefore there is every likelihood of ***collusion*** between the two firms. The firms may agree on a price, or divide the total market, or assign quota, or merge themselves into one unit and form a monopoly or try to differentiate their products or accept the price fixed by the leader firm, etc.
- (b) In case of ***perfect substitutes*** the two firms may be engaged in ***price competition***. The firm having lower costs, better goodwill and clientele will drive the rival firm out of the market and then establish a monopoly.
- (c) If the products of the duopolists are ***differentiated***, each firm will have a close watch on the actions of its rival firms. The firm good quality product with lesser cost will earn abnormal profits. Each firm will fix the price of the commodity and expand output in accordance with the demand of the commodity in the market.

2. Price and Output Determination under Oligopoly:

- (a) If an industry is composed of few firms each selling ***identical or homogenous products*** and having powerful influence on the total market, the price and output policy of each is likely to affect the other appreciably, therefore they will try to promote ***collusion***.
- (b) In case there is ***product differentiation***, an oligopolist can raise or lower his price without any fear of losing customers or of immediate reactions from his rivals. However, keen rivalry among them may create condition of ***monopolistic competition***.

There is no single theory which satisfactorily explains the oligopoly behaviour regarding price and output in the market. There are set of theories like Cournot Duopoly Model, Bertrand Duopoly Model, the Chamberlin Model, the Kinked Demand Curve Model, the Centralised Cartel Model, Price Leadership Model, etc., which have been developed on particular set of assumptions about the reaction of other firms to the action of the firm under study.

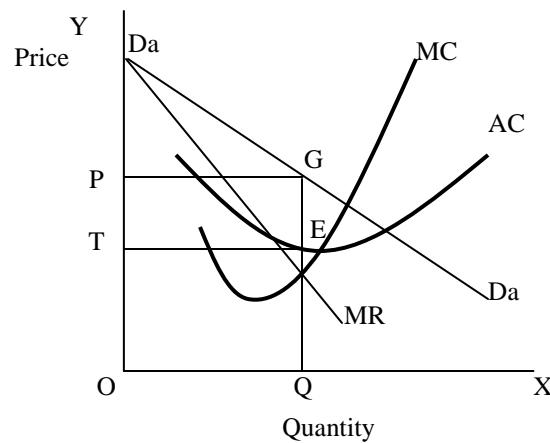
COLLUSIVE OLIGOPOLY:

The degree of imperfect competition in a market is influenced not just by the number and size of firms but by how they behave. When only a few firms operate in a market, they see what their rivals are doing and react. ‘Strategic interaction’ is a term that describes how each firm’s business strategy depends upon its rivals’ business behaviour.

When there are only a small number of firms in a market, they have a choice between ‘cooperative’ and ‘non-cooperative’ behaviour:

- Firms act **non-cooperatively** when they act on their own without any explicit or implicit agreement with other firms. That’s what produces ‘price wars’.
- Firms operate in a **cooperative** mode when they try to minimise competition between them. When firms in an oligopoly actively cooperate with each other, they engage in ‘collusion’. Collusion is an oligopolistic situation in which two or more firms jointly set their prices or outputs, divide the market among them, or make other business decisions jointly.

A ‘cartel’ is an organisation of independent firms, producing similar products, which work together to raise prices and restrict output. It is strictly illegal in Pakistan and most countries of the world for companies to collude by jointly setting prices or dividing markets. Nonetheless, firms are often tempted to engage in ‘tacit collusion’, which occurs when they refrain from competition without explicit agreements. When firms tacitly collude, they often quote identical (high) prices, pushing up profits and decreasing the risk of doing business. The rewards of collusion, when it is successful, can be great. It is more illustrated in the following diagram:



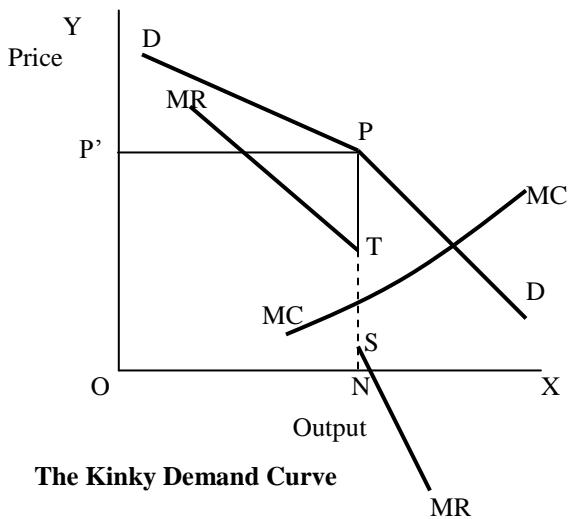
Equilibrium under Collusive Oligopoly

The above diagram illustrates the situation of oligopolist A and his demand curve DaDa assuming that the other firms all follow firm A's lead in raising and lowering prices. Thus the firm's demand curve has the same elasticity as the industry's DD curve. The optimum price for the collusive oligopolist is shown at point G on DaDa just above point E. This price is identical to the monopoly price, it is well above marginal cost and earns the colluding oligopolists a handsome monopoly profit.

PRICE DETERMINATION MODELS OF OLIGOPOLY:

1. Kinky Demand Curve: The kinky demand curve model tries to explain that in non-collusive oligopolistic industries there are not frequent changes in the market prices of the products. The demand curve is drawn on the assumption that the kink in the curve is always at the ruling price. The reason is that a firm in the market supplies a significant share of the product and has a powerful influence in the prevailing price of the commodity. Under oligopoly, a firm has two choices:

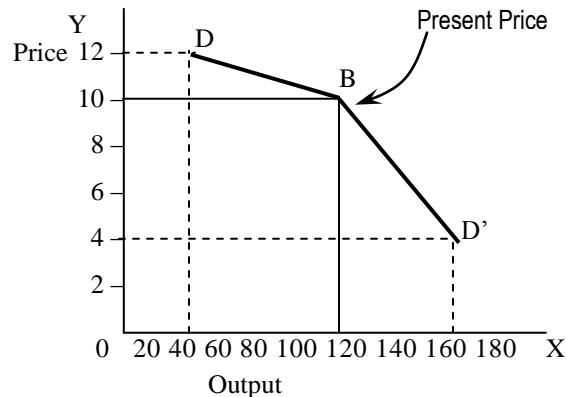
- (a) The first choice is that the firm **increases the price** of the product. Each firm in the industry is fully aware of the fact that if it increases the price of the product, it will lose most of its customers to its rival. In such a case, the upper part of demand curve is more elastic than the part of the curve lying below the kink.
- (b) The second option for the firm is to **decrease the price**. In case the firm lowers the price, its total sales will increase, but it cannot push up its sales very much because the rival firms also follow suit with a price cut. If the rival firms make larger price cut than the one which initiated it, the firm which first started the price cut will suffer a lot and may finish up with decreased sales. The oligopolists, therefore avoid cutting price, and try to sell their products at the prevailing market price. These firms, however, compete with one another on the basis of quality, product design, after-sales services, advertising, discounts, gifts, warranties, special offers, etc.



In the above diagram, we shall notice that there is a discontinuity in the marginal revenue curve just below the point corresponding to the kink. During this discontinuity the

marginal cost curve is drawn. This is because of the fact that the firm is in equilibrium at output ON where the MC curve is intersecting the MR curve from below.

The kinky demand curve is further explained in the following diagram:



In the above diagram, the demand curve is made up of two segments DB and BD'. The demand curve is kinked at point B. When the price is Rs. 10 per unit, a firm sells 120 units of output. If a firm decides to charge Rs. 12 per unit, it loses a large part of the market and its sales come down to 40 units with a loss of 80 units. In case, the producer lowers the price to Rs. 4 per unit, its competitors in the industry will match the price cut. Its sales with a big price cut of Rs. 6 increases the sale by only 40 units. The firm does not gain as its total revenue decreases with the price cut.

2. Price Leadership Model: Under price leadership, one firm assumes the role of a price leader and fixes the price of the product for the entire industry. The other firms in the industry simply follow the price leader and accept the price fixed by him and adjust their output to this price. The price leader is generally a very large or dominant firm or a firm with the lowest cost of production. It often happens that price leadership is established as a result of price war in which one firm emerges as the winner.

In oligopolistic market situation, it is very rare that prices are set independently and there is usually some understanding among the oligopolists operating in the industry. This agreement may be either tacit or explicit.

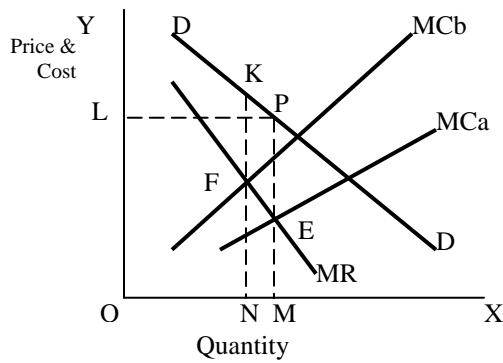
Types of Price Leadership: There are several types of price leadership. The following are the principal types:

- (a) **Price leadership of a dominant firm**, i.e., the firm which produces the bulk of the product of the industry. It sets the price and rest of the firms simply accepts this price.
- (b) **Barometric price leadership**, i.e., the price leadership of an old, experienced and the largest firm assumes the role of a leader, but undertakes also to protect the interest of all firms instead of promoting its own interests as in the case of price leadership of a dominant firm.

- (c) **Exploitative or Aggressive price leadership**, i.e., one big firm built its supremacy in the market by following aggressive price leadership. It compels other firms to follow it and accept the price fixed by it. In case the other firms show any independence, this firm threatens them and coerces them to follow its leadership.

Price Determination under Price Leadership: There are various models concerning price-output determination under price leadership on the basis of certain assumptions regarding the behaviour of the price leader and his followers. In the following case, there are few assumptions for determining price-output level under price leadership:

- (a) There are only **two firms A and B** and firm A has a lower cost of production than the firm B.
- (b) The **product is homogenous or identical** so that the customers are indifferent as between the firms.
- (c) Both A and B have **equal share in the market**, i.e., they are facing the same demand curve which will be the half of the total demand curve.



Equilibrium under Price Leadership

In the above diagram, MCA is the marginal cost curve of firm A and MCb is the marginal cost curve of firm B. Since we have assumed that the firm A has a lower cost of production than the firm B, therefore, the MCA is drawn below MCb.

Now let us take the firm A first, firm A will be maximising its profit by selling OM level of output at price MP, because at output OM the firm A will be in equilibrium as its marginal cost is equal to marginal revenue at point E. Whereas the firm B will be in equilibrium at point F, selling ON level of output at price NK, which is higher than the price MP. Two firms have to charge the same price in order to survive in the industry. Therefore, the firm B has to accept and follow the price set by firm A. This shows that firm A is the price leader and firm B is the follower.

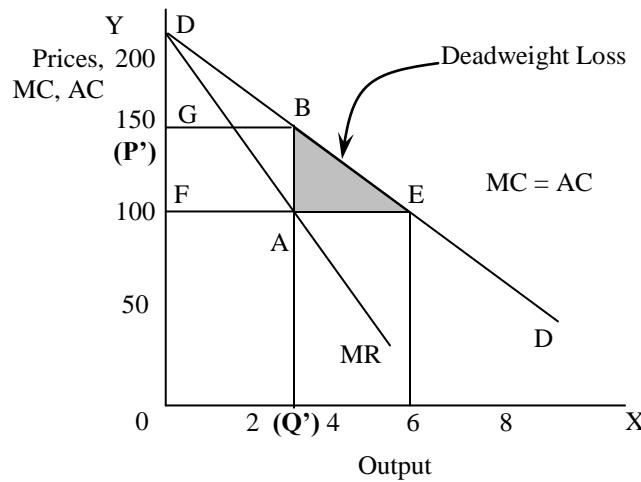
Since the demand curve faced by both firms is the same, therefore, the firm B will produce OM level of output instead of ON. Since the marginal cost of firm B is greater than the marginal cost of firm A, therefore, the profit earned by firm B will be lesser than the profit earned by firm A.

Difficulties of Price Leadership: The following are the challenges faced by a price leader:

- (a) It is difficult for a price leader to correctly assess the reactions of his followers.
- (b) The rival firms may secretly charge lower prices when they find that the leader charged unduly high prices. Such price cutting devices are rebates, favourable credit terms, money back guarantees, after delivery free services, easy instalment sales, etc.
- (c) The rivals may indulge in non-price competition. Such non-price competition devices are heavy advertisement and sales promotion.
- (d) The high price set by the price leader may also attract new entrants into the industry and these new entrants may not accept his leadership.

ECONOMIC COSTS OF IMPERFECT COMPETITION AND OLIGOPOLY:

- (a) **The cost of inflated prices and insufficient output:** The monopolist, by keeping the output a little scarce, raises its price above marginal cost. Hence, the society does not get as much of the monopolist's output as it wants in terms of product's marginal cost and marginal value. The same is true for oligopoly and monopolistic competition.
- (b) **Measuring the waste from imperfect competition:** Monopolists cause economic waste by restricting output. If the industry could be competitive, then the equilibrium would be reached at the point where $MC = P$ at point E. Under perfect competition, this industry's quantity would be 6 with a price of 100. The monopolist would set its MC equal to MR (not to P), displacing the equilibrium to $Q = 3$ and $P = 150$. The GBAF is the monopolist's profit, which compares with a zero-profit competitive equilibrium. Economists measure the economic harm from insufficiency in terms of the deadweight loss; this term signifies the loss in real income that arises because of monopoly, tariffs and quotas, taxes, or other distortions. The efficiency loss is the vertical distance between the demand curve and the MC curve. The total deadweight loss from the monopolist's output restriction is the sum of all such losses represented by the grey triangle ABE:



The Economic Waste cause by the Monopolist

In the above diagram, DD curve represents the consumers' marginal utility at each level of output, while the MC curve represents the opportunity cost of the devoting production to this good rather than to other industries. For example, at $Q = 3$, the vertical difference between B and A represents the utility that would be gained from a small increase to the output of Q. Adding up all the lost social utility from $Q = 3$ to $Q = 6$ gives the shaded region ABE.

EMPIRICAL STUDIES OF COSTS OF MONOPOLY:

1. Economists have studied impact of the overall costs of imperfect competition to an economy. These studies estimate the deadweight loss of consumer surplus in ABE for all industries. Early studies set the total deadweight loss from monopoly at less than 0.1% of US GDP. Now, in modern days, it would total only about \$7 billion.
2. The next important reservation about this approach is that it ignores the impact of market structure upon technological advance or 'dynamic efficiency'. But according to Schumpeterian hypothesis, imperfect competition actually promotes the invention and technological advances which offset the efficiency loss from too high prices.
3. Some skeptical economists retort that monopolists mainly promote the quiet life, poor quality and uncivil service. Indeed, a common complaint about companies with a dominant market position is that they pay little attention to quality of product.
4. Most people object to imperfect competition on the grounds that monopolists may be earning supernormal profits and enriching themselves at the expense of hapless consumers.

INTERVENTION STRATEGIES:

According to a Nobel Prize winner Milton Friedman, basically there are three choices – private unregulated monopoly, private monopoly regulated by the government, or the government operation. In most market economies of the world, the monopolists are regulated by the State. There are several methods and tools for controlling the power misuse by monopolistic and oligopolistic firms:

1. **Anti-trust Policy:** Anti-trust policies are laws that prohibit certain kinds of behaviour (such as firm's joining together to fix prices) or curb certain market structures (such as pure monopolies and highly concentrated oligopolies).
2. **Encouraging Competition:** Most generally, anticompetitive abuses can be avoided by encouraging competition whenever possible. There are many government policies that can promote vigorous rivalry even among large firms. In particular, it is crucial to keep the barriers to entry low.
3. **Economic Regulations:** Economic regulation allows specialised regulatory agencies to oversee the prices, outputs, entry, and exit of firms in regulated industries such as public utilities and transportation. Unlike antitrust policies, which tell businesses what not to do, regulation tells businesses what to do and how to do.

- 4. *Government Ownership of Monopolies:*** Government ownership of monopolies has been an approach widely used. In recent years, many governments have privatised industries that were in former times public enterprises, and encouraged other firms to enter for competition.
- 5. *Price Control:*** Price control on most goods and services has been used in wartime, partly as a way of containing inflation, partly as a way of keeping down prices in concentrated industries.
- 6. *Taxes:*** Taxes have sometimes been used to alleviate the income-distribution effects. By taxing monopolies, a government can reduce monopoly profits, thereby softening some of the socially unacceptable effects of monopoly.