Oligopoly

Oligopoly is a kind of market structure where there are few firms. Number of firms may be varied between two to seventeen firms. In oligopoly each firm has considerable market share, therefore, there is high degree of interdependency i.e. decision take by one firm may influence the decision be taken by any other firms.

In this market product may be homogeneous or may be differentiated. There are considerable barrier on the entrance of new firms. In oligopoly firms are **price makers** because demand curve of each and every firm is downward sloping.

Firms may **collude or compete** with each other. There are two kinds of collusion, that is, formal and informal. Informal collusions are also called as **tacit.** In tacit firms have verbal or unwritten agreement, which may be breached.

Usually in tacit a **price leader** is chosen where it sets the price and the others follow it to avoid uncertainty.

There are various forms of price leadership. The most common types are

(a) Price leadership by a low cost firm.
(b) Price leadership by a large dominant firm.
(c) Barometric price leadership, where all firms follow the changes of the price of a firm which is considered to have a good knowledge of the prevailing condition in the market and can forecast better than the other firms.

With price leadership, there is no formal agreement. Rather, the choice of the leader, the criteria it uses to set its price and the willingness of other firms to follow come about because the firms realize—without formal discussion—that the system benefits all of them. To protect the price-following firms from cheating i.e. taking large amounts of business by setting a lower price than the price leader—the leader and firms that choose to follow it must be able to punish a cheater. They can do this by setting a low price as quickly as possible after anyone cheats. The expectation of that response will be enough to prevent the cheating in the first place. Hence, the firm which cheats may be advantageous only in the short run.

Formal collusion is called as **cartel.** It implies direct agreement among the competing oligopolists with the aim of reducing the uncertainty arising from their mutual interdependence. In this particular case the aim of the cartel is the maximization of the industry profit.

The firms appoint a central agency, to which they delegate the authority to decide not only the total quantity and the price at which it must be sold so as to attain maximum group profits, but also the allocation of production among the members of the cartel, and the distribution of the maximum joint profit among the participating members.

Market

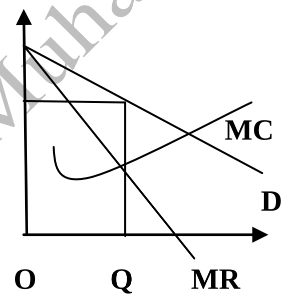


Fig.1

Firm A

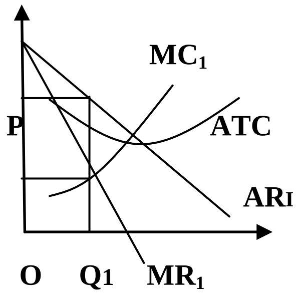


Fig.2

Firm B

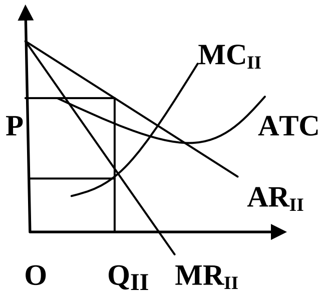


Fig.3

Fig.1 shows demand for a product in the industry, MR shows combined marginal revenue of the given firms and MC shows marginal cost curve of the industry ($MC=MC_1+MC_{II}$). OQ is the equilibrium output of the industry at which there is joint profit maximization. At the given price OP firm A will produce OQ_I, whereas firm B produces OQ_{II} ($OQ = OQ_I + OQ_{II}$).

Firms collaborate or compete, depend on the following conditions.

(a) The number of sellers in the industry: If there are few sellers, firms prefer to collaborate. However if there are large number of firms, collusion cannot last longer; therefore there are more chances for competition.
(b) The nature of the product: if the product is homogenous, collusion lasts longer. On the other hand if firms produce differentiated products, they prefer to compete.
(c) The number of dominant firms: When an industry contains just one dominant firm, small firms prefer to collaborate; however in case of few dominant firms, there are more chances for competition.
(d) Barriers to entry: The higher the barriers to entry, the more the successful is the co-operation; however if firms enter easily; firms prefer to compete.
(e) Condition of the market: if the given industry experiences growth, firms prefer to collude but in case of dwindling situations firm prefer to compete for survival.

The Limits to Collusion. It is tempting to think that collusion—whether cartel or tacit—gives oligopolies absolute power over their markets, leaving them free to jack up prices and exploit the public without limit. But oligopoly power—even with collusion—has its limits.
First, even colluding firms are constrained by the market demand curve: A rise in price will always reduce the market quantity demanded. There is a single price—the cartel monopoly price—that maximizes the total profits of all firms in the market, and it will never serve the group's interest to charge any price higher than this.
Second, collusion—even when it is tacit—may be illegal. Although it may be difficult to prove, companies that even *appear* to be colluding may find themselves facing close government scrutiny.
Third, collusion is limited by powerful incentives to cheat on any agreement. As the next section shows, cheating is an endemic problem among colluding oligopolists and often leads to the collapse of even the most formal agreements.

Price or non-price competition

Price competition can involve discounting the price of a product (or a range of products) to increase demand.

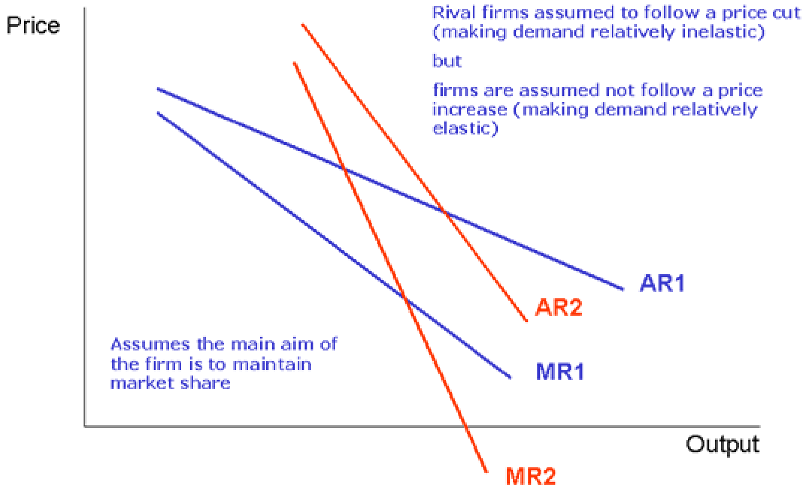
Non-price competition: Non-price competition is a consistent feature of the competitive strategies of oligopolistic firms. Examples of non-price competition include:

a. Free deliveries and installation
b. Extended warranties for consumers and credit facilities
c. Longer opening hours (e.g. supermarkets and petrol stations)
d. Branding of products and heavy spending on advertising and marketing
e. Extensive after-sales service
f. Expanding into new markets + diversification of the product range

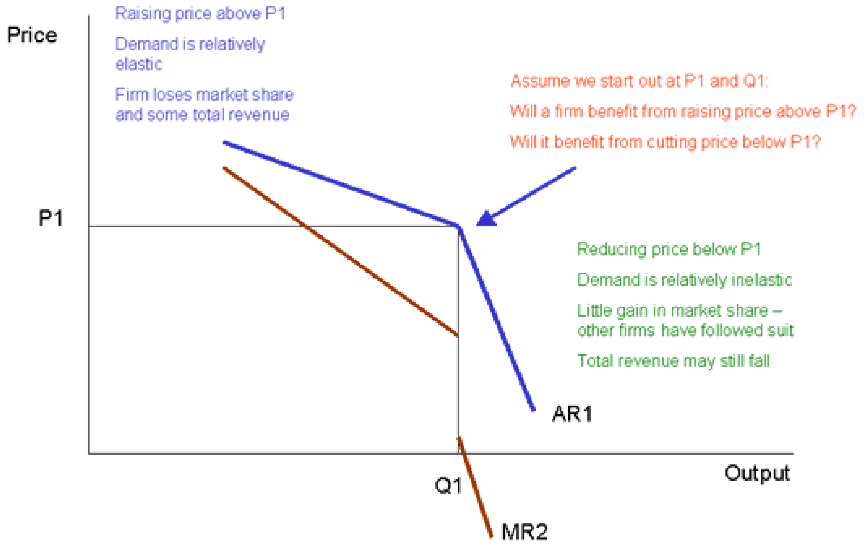
Kinked demand curve under oligopoly

An oligopolistic firm faces a downward sloping demand curve but the elasticity may depend on the reaction of rivals to changes in price and output. Assuming that firms are attempting to maintain a high level of profits and their market share it may be the case that:
(a) Rivals will not follow a price increase by one firm - therefore demand will be relatively elastic and a rise in price would lead to a fall in the total revenue of the firm

(b) Rivals are more likely to match a price fall by one firm to avoid a loss of market share. If this happens demand will be more inelastic and a fall in price will also lead to a fall in total revenue
(c) Each firm has a considerable market share and
(d) There is high degree of mutual interdependency.


Price
Rival firms assumed to follow a price cut (making demand relatively inelastic)
but
firms are assumed not follow a price increase (making demand relatively elastic)
AR1
AR2
MR1
Assumes the main aim of the firm is to maintain market share
Output
MR2

The kink in the demand curve at price P and output Q means that there is a discontinuity in the firm's marginal revenue curve.
If we assume that the marginal cost curve in is cutting the MR curve then the firm is maximising profits at this point.


Raising price above P1
Demand is relatively elastic
Firm loses market share and some total revenue
Price
Assume we start out at P1 and Q1:
Will a firm benefit from raising price above P1?
Will it benefit from cutting price below P1?
P1
Reducing price below P1
Demand is relatively inelastic
Little gain in market share – other firms have followed suit
Total revenue may still fall
AR1
Q1
Output
MR2

In the following diagram, it can be seen that a rise in marginal costs will not necessarily lead to higher prices providing that the new MC curve (MC2) cuts the MR curve at the same output. The kinked demand curve theory suggests that there will be price stickiness in these markets and therefore mostly firms rely more on non-price competition to boost sales, revenue and profits.

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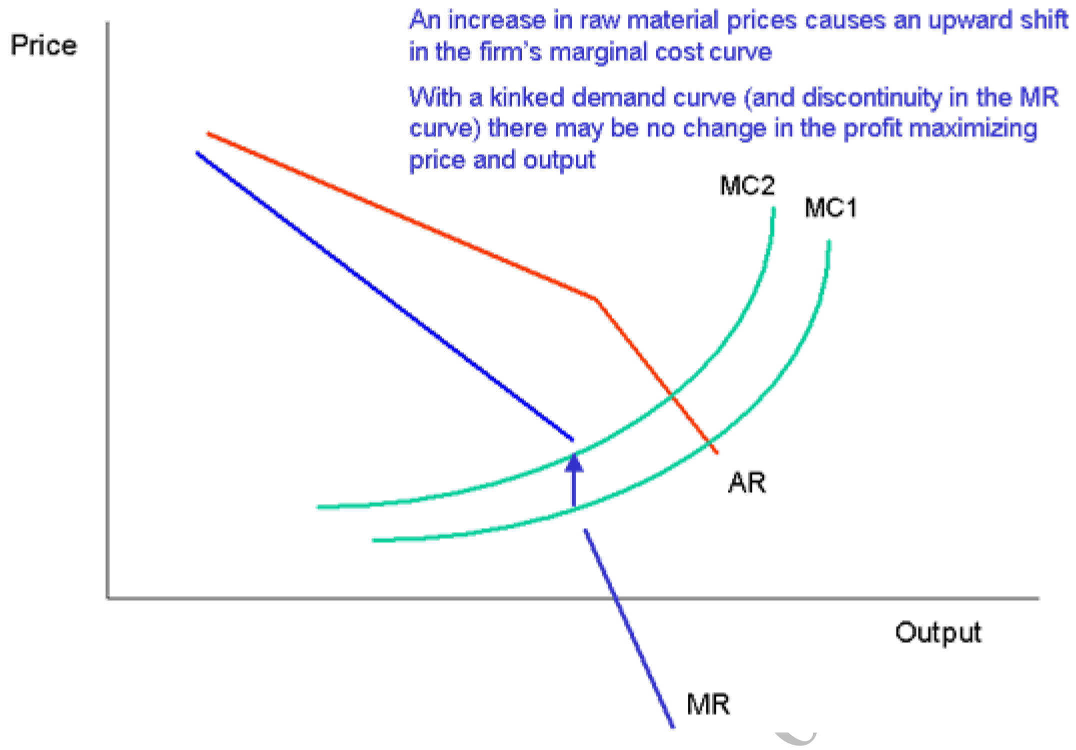


Game theory

It is the branch of economics which concerned with representing economic interactions in highly stylized form, with players, pay-offs and strategies. The game theory is concerned with the study of optimal strategies to maximize pay-offs, given the risk involved in judging the response of adversaries. Since each player knows that the other player(s) will react(s) to its move and takes account of their expected reactions when making moves, therefore, it is considered as study of rational decision making.

Game: A situation in which strategic behaviour is an important part of decision making. In any game there are decision makers; they are called **players**. In oligopoly, the players are the firms in the industry. The choices that a player makes are called a **strategy**, and the particular things done according to a strategy are called **actions**. The rewards enjoyed by a player at the end of a game are called as **Payoffs**.
For example, an industry consists of two firms, X and Y.
The profit-payoff matrix shows how the profits of X and Y vary depending on the prices charged by the two firms.

		price charged by X	
		P_X = \$20	P_X = \$10
price charged by Y	P_Y = \$20	\$5m_X \$5m_Y	\$9m_X –\$2m_Y
	P_Y = \$10	–\$2m_X \$9m_Y	zero$_X$ zero$_Y$

The matrix shows if firm X charges price $20 and firm Y also the same price, then fir X will be able to make profit of $5m and firm Y also make the same profit of $5m. However, if firm X reduces its price to $10 and expect that the firm Y does not change its price it will be able to increase its profit to

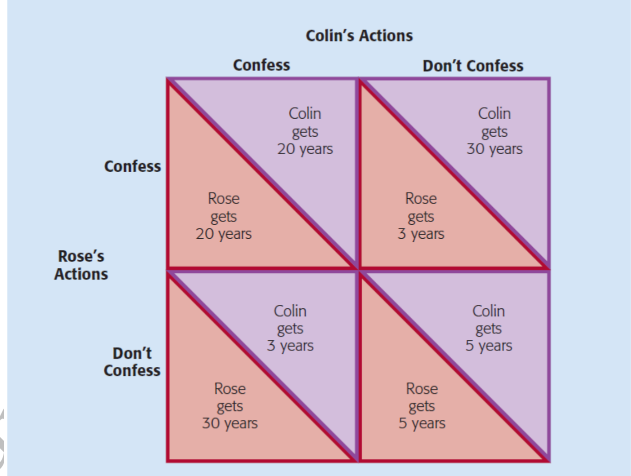
$9m where as firm Y’s profit will fall to -$2m. on the other hand firm Y have the same strategy i.e. if it charges price $20, it will make profit of $5m provided that firm X also charge price of $20 and if firm Y decreases its price to $10 it will be able to increase its profit to $9m and firm X incur loss of $2m if it does not change its price. Now there are two possibilities. If both firms co-operate and charge price of $20, they will be able to make profit of $5m each. It is called as ‘**The co-operative solution’**

In case of **‘Non co-operative equilibrium** or non collusive equilibrium’ which is based on self-policing, each firm wants to make maximum possible profit and will charge price $10 and as a result each firm will make zero profit.

Prisoner’s Dilemma:

The easiest way to understand how game theory works is to start with a simple, noneconomic example—the *prisoner’s dilemma*—that explains why a technique for obtaining confessions, commonly used by police, is so often successful. Imagine that two partners in crime (let’s call them Rose and Colin) have committed a serious offense (say, murder) but have been arrested for a lesser offense (say, robbery). The police have enough evidence to ensure a robbery conviction, but their evidence for murder cannot be used in court. Their only hope for a murder conviction is to get one or both partners to incriminate the other.

The traditional strategy is to separate the prisoners and explain the following to each one: “Look, you’re already facing a five-year sentence for robbery. But we’ll offer you a deal: If you confess to the murder and implicate your partner, and your partner does *not* confess, we’ll make sure that the Court goes easy on you and you’ll get three years of imprisonment. If you and your partner *both* confess, we’ll send you each away for 20 years. But if your partner confesses, and you do *not*, we’ll send *you* away for 30 years.”



THE PRISONER’S DILEMMA

Rose’s Actions	Colin’s Actions: Confess	Colin’s Actions: Don’t Confess
Confess	Colin gets 20 years Rose gets 20 years	Colin gets 30 years Rose gets 3 years
Don’t Confess	Colin gets 3 years Rose gets 30 years	Colin gets 5 years Rose gets 5 years

The pay-off matrix shows the outcomes to each of two prisoners for each pair of strategies they make. Now let’s look the game from Colin’s point of view. Colin wants the best possible deal for himself, but he is not sure what his partner will do. If Colin confesses and Rose also confesses then Colin gets jail for 20 years but if Rose does not confess then Colin gets jail for 3 years. So under these conditions the best choice for Colin is to confess. In this game the strategy ‘confess’ is an example of ‘dominant strategy’.

A ‘dominant strategy’ *is a strategy that is best for a player regardless of the strategy of the other player.*