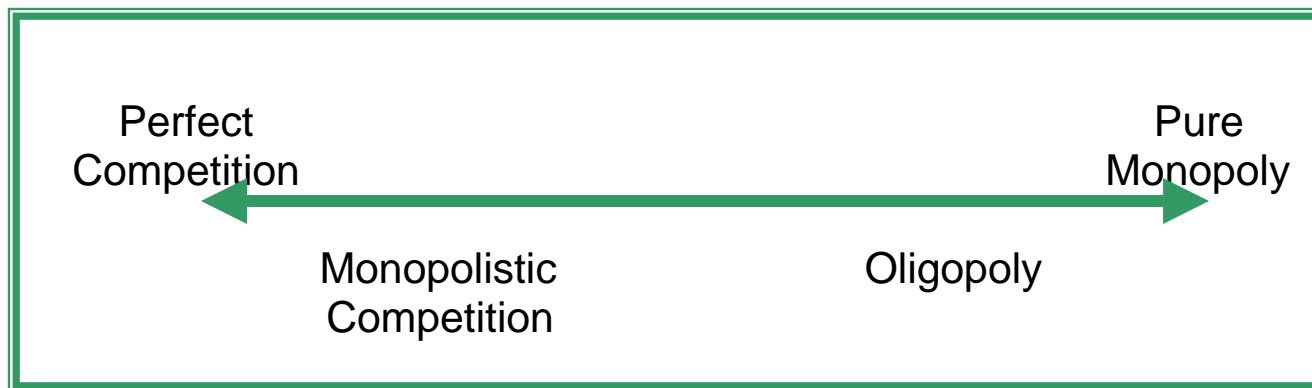


Topic 6

Oligopoly and Monopolistic Competition

- * Monopolistic Competition
- * Oligopoly
- * Cartels & Collusive Agreements
- * Game Theory & Nash Equilibrium



Monopolistic Competition

➤ With monopolistic competition all firms sell a somewhat _____ product.

Product differentiation is the primary defining difference with this market structure compared to _____ competition.

With perfect competition, the product produced by all firms in the industry is identical.

With monopolistic competition, each product within the industry is just a bit different.

Such differences can be in the product's physical make-up (Coke versus Pepsi), or in the amount of service each firm offers (Payless shoes versus Footlocker).

Because of these differences, producers have a certain amount of control over the _____ of their product, although it is usually small because the products of other firms are very similar to their own.

➤ In addition to product differentiation, there are **four** other conditions that must be met for an industry to be considered to be part of the market structure known as monopolistic competition:

- 1) **There must be a large number of _____ in the industry.**

The good must be produced by at least 50 to 100 firms, with each firm's product a close substitute for the products of the other firms in the industry.

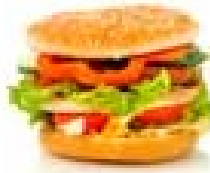
- 2) **The number of firms in the industry must be large enough that each firm expects its _____ to be of no real concern or ignored by its rivals, and it is not concerned with possible retaliatory moves by its _____.**

With a large number of firms within the industry, this is usually met. The actions of the firm are not driven explicitly by the possible responses of its competitor.

3) **There must be easy _____ into the industry.**

No legal barriers.

4) **There must be no _____, such as price fixing or market sharing among firms in the industry.**

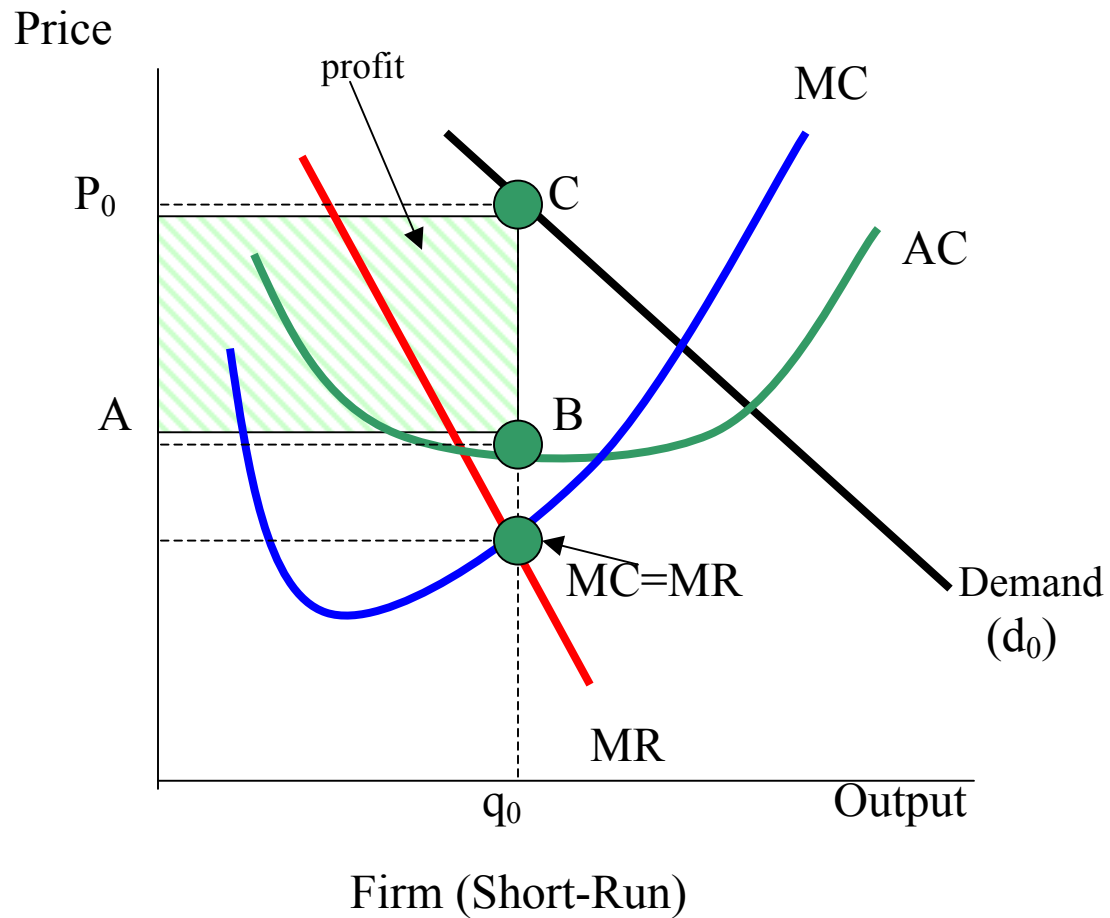


Price and Output Decisions Under Monopolistic Competition

Because each firm produces a slightly different product, the demand curve facing each firm slopes _____ to the right.

- If the firm raises its _____, the quantity demanded for its product will go down, but will not completely disappear. It will still retain some of its customers and not lose all of its customers to other firms. Conversely, if the firm decides to lower its _____, it will gain some customers, but not all of its competitors' customers. (Product loyalty.)



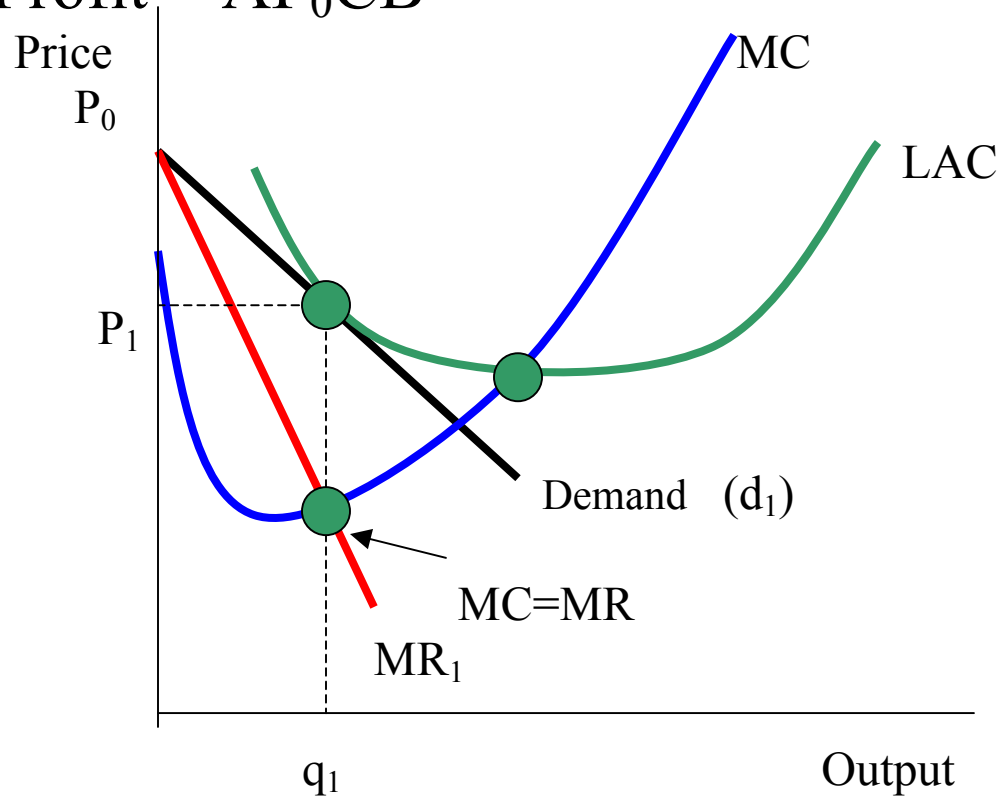


The diagram illustrates the **short run** equilibrium of a monopolistically competitive firm.

- The firm will set its price at P_0 and output rate at q_0 , due to the fact that it will maximize its profits where $\underline{\quad} = \mathbf{MR}$.

Profit will be earned because P_0 is higher than average total cost at this output of q_0 . ($P_0 > A$)

Profit = AP_0CB



The next diagram illustrates the **long run equilibrium**.

- P _____ are temporary since there are no barriers to entry.
- Other firms can enter and sell similar products.

As firms enter the industry, the firm's demand function shifts _____.

In the long run, each firm must be making no profit and maximizing its profits.

The zero profit condition is met at the combination of price= P_1 and output= q_1 , since the firm's average cost at this output equals price P_1 .

Profit maximization is met, since $MR = \underline{\hspace{2cm}}$ at this output rate.

- In monopolistically competitive industries, are competed away with entry of new firms, just like they are in competitive industries.

- Unlike competitive industries, each monopolistically competitive firm is a **maker**, and therefore price exceeds marginal cost. ➤ Marginal cost equals price in a competitive industry.

- Under monopolistic competition each firm produces a smaller than a competitive firm. Long run average cost is higher than minimum average cost.

But, consumers _____ from the variety of products and the ability of the industry to cater to particular demands of some consumers.



Oligopoly

There is no single theory of oligopoly.

In contrast to perfect competition or monopoly, where there is a single model, many types of oligopoly models exist.

Depending on the circumstances each one of these theories may be appropriate.

➤ An **oligopoly** is a market structure with a limited or small number of _____.

An example in Canada, of an oligopoly is the Chartered Banks.

► Each of the major firms takes account of the _____ of the others when it determines its price and output policy, since its policy will affect the others.

That is, when a firm increases its price, it must _____ the reaction of other firms in the industry. If its competition decides against a price increase, it is likely that the price increase will have to be rescinded; otherwise, its rival will pull away a large number of its customers.

Example: Bank fees



For example, in some industries, the number of firms tends to be small, because _____ costs cannot be achieved unless a firm is producing an output equal to a substantial percentage of the total available market: **economies of scale**.

(Each firm must be large relative to the market.)

Canada

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Legislation and jurisdiction

1 What is the relevant legislation and who enforces it?

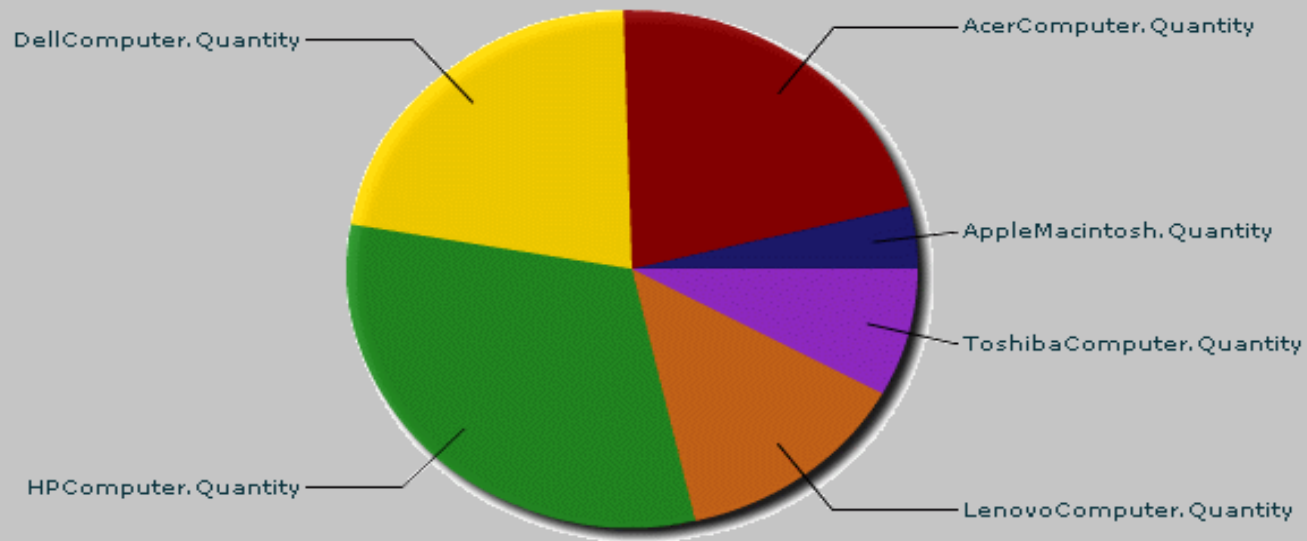
Canada has only one statute governing all aspects of competition law: the federal Competition Act (the Act). The Act is administered and enforced by the commissioner of competition (the commissioner) who serves as the head of the Competition Bureau (the Bureau), a unit of Industry Canada.

The commissioner is responsible for investigating and enforcing

Under the current law, price-fixing or market-allocation conspiracies are not per se illegal in Canada. Rather, the Act prohibits only those conspiracies that have serious or 'undue' competitive effects, as determined under a 'partial rule of reason' analysis. There is no statute of limitations for section 45 offences. As with most other criminal offences, a conviction under the Act requires the prosecution to prove beyond a reasonable doubt both the actus reus (illegal acts) and the mens rea (guilty mind) of the offence.



PC Market Share (1981-2009)



Collusive Agreements

➤ Conditions in oligopolistic industries tend to encourage collusion.

This is because:

- 1) the number of _____ is small
- 2) firms are _____ of their interdependence

If firms collude they will:

- 1) achieve greater _____
- 2) _____ their uncertainty
- 3) have a stronger ability to prevent _____ of new firms

Collusive arrangements are difficult to maintain and control, since the payoff from cheating on the agreement enables the cheating firm to attain even higher profits.

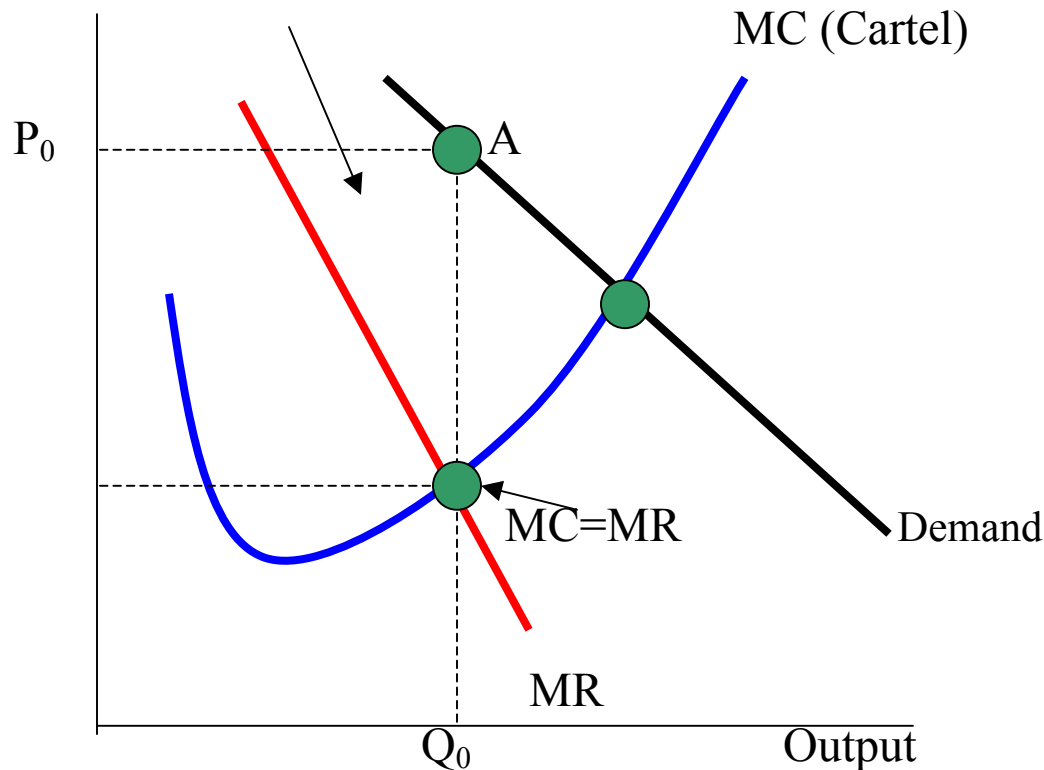
Cartel: is a formal collusive arrangement among firms within an industry.

➤ *What Price Will a Cartel Charge?*

If a cartel is established to set a uniform price for a particular homogeneous product, the cartel must estimate the _____ cost curve for the cartel as a whole.

If we assume that input prices do not increase as the cartel expands, this marginal cost curve is the horizontal sum of the marginal cost curves of the individual firms.

Price



In the diagram, suppose the marginal cost curve for the cartel is shown.

If the demand curve for the industry's product and MR curve are as above, the output that maximizes the total _____ of the cartel members is Q_0 .

That is, if the cartel maximizes profits, it will choose a price P_0 .

This is the monopoly price!

The cartel acts as a _____.

➤ The cartel must distribute the industry's total sales among the firms belonging to the cartel.

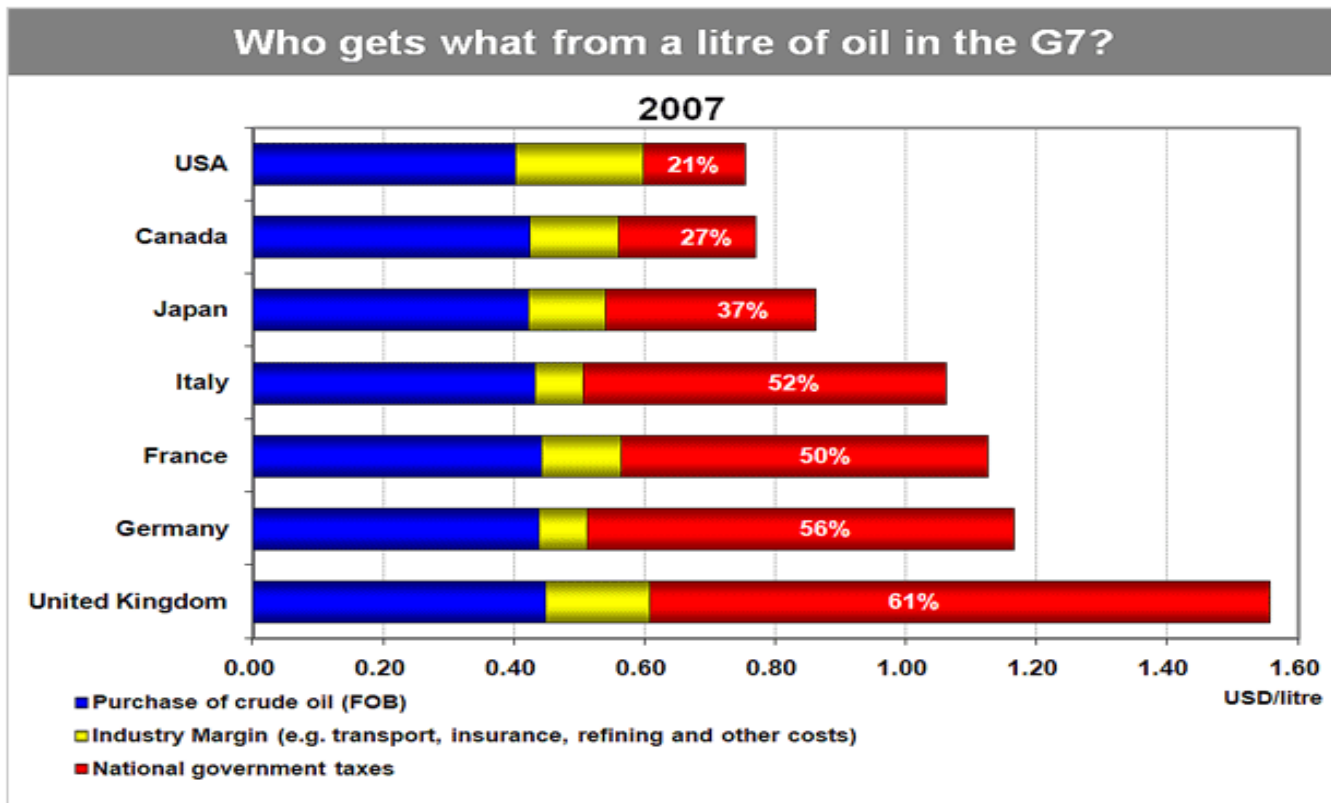
It will allocate sales to firms such that the marginal cost of all firms is equal, in order to maximize cartel profits.

The cartel could make more _____ by reallocating output among firms so as to reduce the cost of producing the cartel's total output.

But this allocation of output is unlikely, since allocation decisions are the result of negotiation between firms with differing productive abilities.

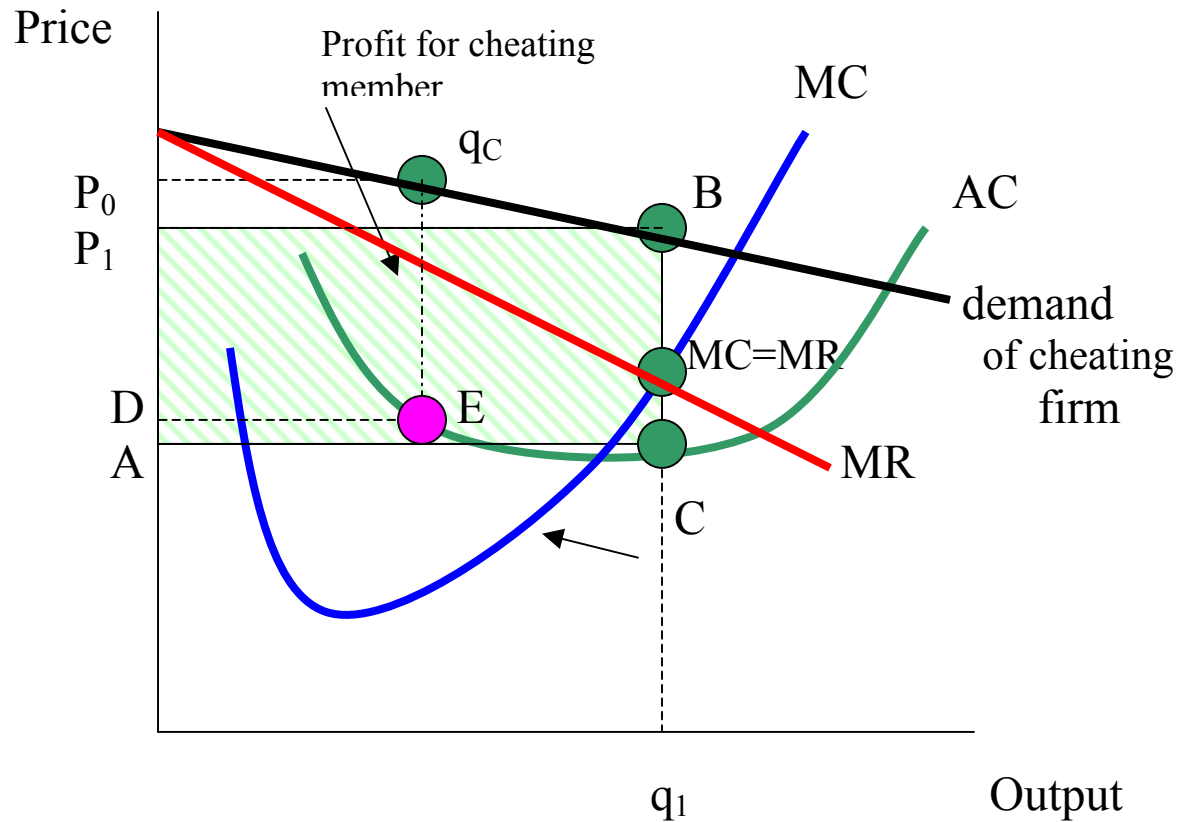
The process of negotiation between firms is very “political”, and the firms with the greatest influence, are likely to receive the largest sales _____, even though this raises total cartel costs.

In practice, sales are often distributed based on a firm's past level of sales, or geographic area.



The Breakdown of Collusive Agreements

➤ Collusive agreements tend to break down.



If the firm were to leave the cartel, it would be faced with this demand curve, as long as the other firms in the cartel maintained a price of P_0 .

This demand curve is _____, (i.e. elastic or price sensitive), and hence, the firm is able to increase its sales by a large amount simply by dropping its price by a small amount.

The firm's maximum _____, if it leaves the cartel or lowers its price secretly, will be attained if it sells an output of q_1 at a price, P_1 where MC equals MR.

This price would result in a _____ of $AP_1 BC$, which is **greater** than the profit earned by conforming to the sales quota and price dictated by the cartel.

A firm that breaks its cartel association, can raise its profits as long as other firms do not do the same thing, and the cartel does not retaliate or _____ the firm in some way.

If all firms cheat, the cartel dissolves.

Profit for non-cheater = $P_0 q_c ED$

Profit for cheater = $P_1 BCA$

A Cartel's response to cheating: an empirical investigation of the De Beers diamond empire.

Publication: [Southern Economic Journal](#)

Publication Date: 01-JUL-06

Article Excerpt

Format: Online

Delivery: Immediate Online Access

Threats as Credible Deterrents to Cheating in Cartels: A Comparative Analysis in a Static Framework

Robert Rothschild

Australian Economic Papers, 1987, vol. 26, issue 49, pages 216-24

Example: The Anderberg Company and the Burnsberg Company are the only two firms that produce and sell a particular kind of camera lens. The demand curve for their product is

$$P = 580 - 3Q$$

where P is the price (in dollars) of the product and Q is the total amount demanded. The total cost function of the Anderberg Company is

$$TC_A = 410Q_A,$$

where TC_A is its total cost (in dollars), and Q_A is its output. The total cost function of the Burnsberg Company is

$$TC_B = 460Q_B$$

where TC_B is its total cost (in dollars) and Q_B is its output.

- A) If these two firms collude, and if they want to maximize their combined profits, how much will the Anderberg Company produce?
- B) How much will the Burnsberg Company produce?
- C) Will the Burnsberg Company agree to such an arrangement? Why or why not?

Solutions:

- a)
- b)
- c)

Game Theory

Managers who must analyse and participate in oligopolistic decision making, are very likely to use modern game theory.

Since a basic feature of oligopoly is that each firm must take account of its rivals' _____ to its own decision making, oligopolistic decision making has many of the characteristics of a game.

Game theory attempts to study decision making where, like an oligopoly, there is a mixture of _____ and cooperation.

A **g**_____ is a competitive situation in which two more opponents pursue their own interests, and no one can dictate the outcome.

Each **p**_____ of the game is a decision making entity with a certain amount of allocated resources.

The **r**_____ of the game describe how resources can be used.

A **s**_____ specifies what a player will do under each situation while playing the game.

- These are the actions that will be taken in response to a particular action taken by another player, or actions that reflect where the player wants to end up.

A player's **payoff** varies from game to game.

For two-player games, the possible outcomes are illustrated with the aid of a **payoff matrix**.

	<u>Possible Strategies For Firm B</u>		
	1	2	
<u>Possible Strategies for Firm A</u>	3	A's profit: \$ __ B's profit: \$40	A's profit: \$ __ B's profit: \$30
	4	A's profit: \$ __ B's profit: \$30	A's profit: \$ __ B's profit: \$20

➤ Firm A can choose strategy 3 or 4 and Firm B can choose strategy 1 or 2.

The payoff, expressed in terms of *profits* for each firm, is shown above for each combination of strategies.

In this game, there is a **d** **strategy** for each player.

Regardless of whether Firm B chooses strategy 1 or 2, Firm A will make more profit if it chooses strategy 4 rather than 3. Strategy 4 is Firm A's **dominant strategy**.

Similarly, regardless of whether Firm A adopts strategy 3 or 4, firm B will make more profit if it chooses strategy 1 rather than 2. Hence, strategy 1 is Firm B's **dominant strategy**.

The solution to this game is that Firm A chooses strategy 4 and Firm B chooses strategy 1.

Nash Equilibrium

Not all games have a dominant strategy for every player.

	Possible Strategies For Firm B	
	1	2
<u>Possible Strategies for Firm A</u>	3	4
	A's profit: \$30 B's profit: \$	A's profit: \$20 B's profit: \$
	A's profit: \$40 B's profit: \$	A's profit: \$30 B's profit: \$

Suppose the pay off matrix for Firms A and B are as shown.

Under these circumstances, Firm A *still* has a dominant strategy: 4. Regardless of which strategy firm B adopts, strategy 4 is firm A's best strategy.

But firm B no longer has a dominant strategy. **Its optimal strategy depends on what firm A decides to do.**

- If Firm A chooses strategy 3, firm B will make more profit if it chooses strategy 1 rather than strategy 2.
- If Firm A adopts strategy 4, Firm B will make more profit if it chooses strategy 2 rather than strategy 1.

To determine what action should be taken, Firm B must try to **anticipate** what action Firm A will take.

That is, Firm B must try to figure out what the best action it would take if *it* was Firm A.

Since we know from the table that Firm A's dominant strategy is strategy 4, Firm B can surmise that this strategy will occur.

Firm A will most likely choose strategy 4, and hence, Firm B will choose strategy 2 because it is more profitable than strategy 1 if Firm A adopts strategy 4.

Thus, Firm A is expected to adopt Strategy 4 and Firm B is expected to adopt strategy 2.

This is the **Nequilibrium** for this game.

A Nash equilibrium is a set of strategies such that each player believes that it is doing the _____ it can given the strategy of the _____ player.

Neither player regrets its own decision or has any incentive to change it.

What is the difference between a Nash equilibrium and an equilibrium where each player has a dominant strategy?

If each player has a dominant strategy, this strategy is its best choice *r* of what other players do.

In a Nash equilibrium, each player adopts a strategy that is its **best choice** _____ what the other players do.

It is important to recognize that some games do not have a Nash equilibrium and that some games have more than one Nash equilibrium.

The next table is an example of a payoff matrix for a game with **two Nash equilibria.**

	<u>Possible Strategies For Firm B</u>	
	1	2
<u>Possible Strategies for Firm A</u>	3	4
	A's profit: \$ ___ B's profit: \$ ___	A's profit: \$0 B's profit: \$0
	A's profit: \$ ___ B's profit: \$ ___	A's profit: \$50 B's profit: \$50

If Firm A adopts strategy 3 and Firm B adopts strategy 1, each is doing the best it can given the other's choice of strategy.

If Firm A adopts strategy 4 and B adopts strategy 2, each is doing the best it can given the other's choice of strategy.

Hence, there are two Nash equilibriums this game.

		Husband	
		golf	film
Wife	golf	5,4	2,3
	film	3,2	4,5

		F2	
		High	Low
F1	High	11,9 ←	1,2
	Low	4,2	3,4 ↓