Oligopoly

Chapter 16-2

Models of Oligopoly Behavior

- **No single general model of oligopoly behavior exists.**

Oligopoly

- An **oligopoly** is a market structure characterized by:
  - **Few firms**
  - **Either standardized or differentiated products**
  - **Difficult entry**

Interdependence

- A key characteristic of oligopolies is that each firm **can** affect the market, making each firm's choices dependent on the choices of the other firms. They are **interdependent**.

Characteristics Oligopoly

- Oligopolies are made up of a small number of mutually interdependent firms.
- Each firm must take into account the expected reaction of other firms.

Interdependence

- The importance of interdependence is that it leads to strategic behavior.
- **Strategic behavior** is the behavior that occurs when what is best for A depends upon what B does, and what is best for B depends upon what A does.
- Oligopolistic behavior includes both ruthless competition and cooperation.

Game Theory

- Strategic behavior has been analyzed using the mathematical techniques of **game theory**.
- **Game theory** provides a description of oligopolistic behavior as a series of strategic moves and countermoves.

Characteristics of Oligopoly

- Oligopolies are made up of a small number of firms in an industry
- In any decision a firm makes, it must take into account the expected reaction of other firms
- Oligopolistic firms are mutually interdependent
- Oligopolies can be collusive or noncollusive
- Firms may engage in **strategic decision making** where each firm takes explicit account of a rival's expected response to a decision it is making

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Models of Oligopoly Behavior

- There is no single model of oligopoly behavior
- An oligopoly model can take two extremes:
  - The **cartel model** is when a combination of firms acts as if it were a single firm and a monopoly price is set
  - The **contestable market model** is a model of oligopolies where barriers to entry and exit, not market structure, determine price and output decisions and a competitive price is set
- Other models of oligopolies give price results between the two extremes

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The Cartel Model

- A cartel model of oligopoly is a model that assumes that oligopolies act as if they were a monopoly and set a price to maximize profit
- Output quotas are assigned to individual member firms so that total output is consistent with joint profit maximization
- If oligopolies can limit the entry of other firms, they can increase profits

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Implicit Price Collusion

- Explicit (formal) collusion is illegal in the U.S. while implicit (informal) collusion is permitted
- **Implicit price collusion** exists when multiple firms make the same pricing decisions even though they have not consulted with one another
- Sometimes the largest or most dominant firm takes the lead in setting prices and the others follow

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Why Are Prices Sticky?

- One characteristic of informal collusive behavior is that prices tend to be sticky – they don't change frequently
- Informal collusion is an important reason why prices are sticky
- Another is the kinked demand curve
  - If a firm increases price, others won't go along, so demand is very elastic for price increases
  - If a firm lowers price, other firms match the decrease, so demand is inelastic for price decreases

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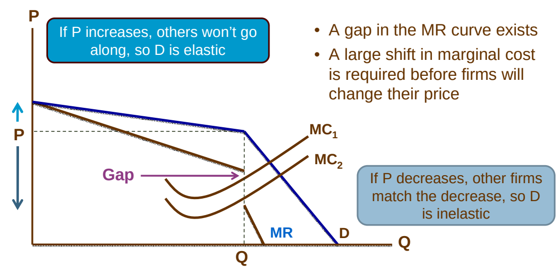
The Kinked Demand Curve Graph



- A gap in the MR curve exists
- A large shift in marginal cost is required before firms will change their price

The Contestable Market Model

- The **contestable market model** is a model of oligopolies where barriers to entry and exit, not market structure, determine price and output decisions and a competitive price is set
- Even if the industry contains only one firm, it will set a competitive price if there are no barriers to entry
- Much of what happens in oligopoly pricing is dependent on the specific legal structure within which firms interact

Comparing Contestable Market and Cartel Models

- The cartel model is appropriate for oligopolists that collude, set a monopoly price, and prevent market entry
- The contestable market model describes oligopolies that set a competitive price and have no barriers to entry
- Oligopoly markets lie between these two extremes
- Both models use **strategic pricing decisions** where firms set their price based on the expected reactions of other firms

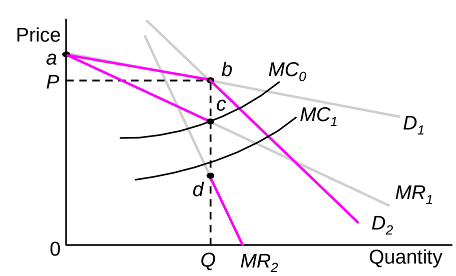
New Entry as a Limit on the Cartelization Strategy and Price Wars

- The threat of outside competition limits oligopolies from acting as a cartel
- The threat will be more effective if the outside competitor is much larger than the firms in the oligopoly
- Price wars are the result of strategic pricing decisions gone wild
- A **predatory pricing strategy** involves temporarily pushing the price down in order to drive a competitor out of business

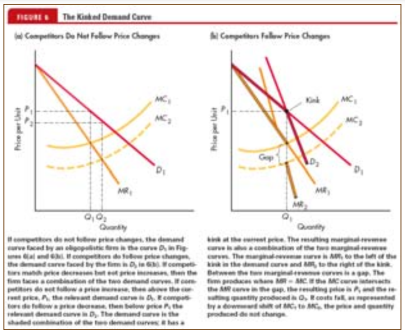
Why Are Prices Sticky?

- When there is a kink in the demand curve, there has to be a gap in the marginal revenue curve.
- The kinked demand curve is not a theory of oligopoly but a theory of sticky prices.

The Kinked Demand Curve



The Kinked Demand Curve



Game Theory and Strategic Decision Making

- The ***prisoner's dilemma*** is a well-known game that demonstrates the difficulty of cooperative behavior in certain circumstances.

Game Theory and Strategic Decision Making

- In the prisoner's dilemma, where mutual trust gets each one out of the dilemma, confessing is the rational choice.

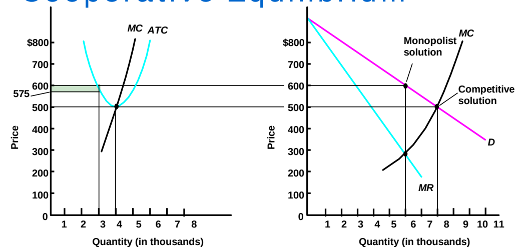
Prisoner's Dilemma and a Duopoly Example

- The prisoners dilemma has its simplest application when the oligopoly consists of only two firms—a duopoly.

Prisoner's Dilemma and a Duopoly Example

- By analyzing the strategies of both firms under all situations, all possibilities are placed in a payoff matrix.
- A ***payoff matrix*** is a box that contains the outcomes of a strategic game under various circumstances.

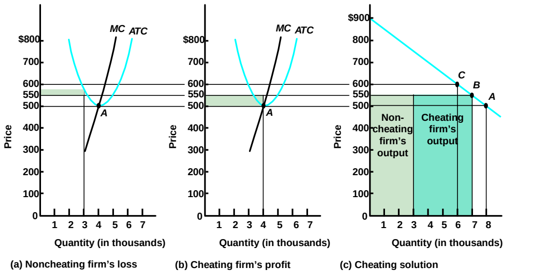
Firm and Industry Duopoly Cooperative Equilibrium



(a) Firm's cost curves

(b) Industry: Competitive and monopolist solution

Firm and Industry Duopoly Equilibrium When One Firm Cheats



Duopoly and a Payoff Matrix

- The duopoly is a variation of the prisoner's dilemma game.
- The results can be presented in a payoff matrix that captures the essence of the prisoner's dilemma.

The Payoff Matrix of Strategic Pricing Duopoly

	A Does not cheat	A Cheats
B Does not cheat	A \$75,000 / B \$75,000	A +\$200,000 / B – \$75,000
B Cheats	A – \$75,000 / B +\$200,000	A 0 / B 0

Dominant Strategy

- In an oligopoly, firms try to achieve a **dominant strategy**—a strategy that produces better results no matter what strategy other firms follow.
- The interdependence of oligopolies decisions can often lead to the prisoner's dilemma.

Prisoner's Dilemma

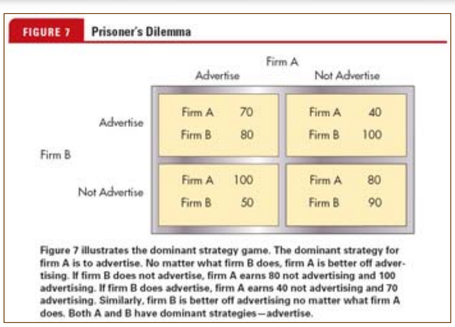


FIGURE 7 Prisoner's Dilemma

		Firm A: Advertise	Firm A: Not Advertise
Firm B	Advertise	Firm A 70, Firm B 80	Firm A 40, Firm B 100
Firm B	Not Advertise	Firm A 100, Firm B 50	Firm A 80, Firm B 90

Figure 7 illustrates the dominant strategy game. The dominant strategy for firm A is to advertise. No matter what firm B does, firm A is better off advertising. If firm B does not advertise, firm A earns 80 not advertising and 100 advertising. If firm B does advertise, firm A earns 40 not advertising and 70 advertising. Similarly, firm B is better off advertising no matter what firm A does. Both A and B have dominant strategies—advertise.

Implicit Price Collusion

- Formal collusion is illegal in the U.S. while informal collusion is permitted.
- ***Implicit price collusion*** exists when multiple firms make the same pricing decisions even though they have not consulted with one another.

Implicit Price Collusion

- Sometimes the largest or most dominant firm takes the lead in setting prices and the others follow.

Cooperation and Cartels

- If the firms in an oligopoly cooperate, they may earn more profits than if they act independently.
- **Collusion**, which leads to secret cooperative agreements, is illegal in the U.S., although it is legal and acceptable in many other countries.
- **Price-Leadership Cartels** may form in which firms simply do whatever a single leading firm in the industry does. This avoids strategic behavior and requires no illegal collusion.

Implicit Price Collusion

Why Are Prices Sticky?

- Informal collusion is an important reason why prices are sticky.
- Another is the kinked demand curve.

Cartels

- A **cartel** is an organization of independent firms whose purpose is to control and limit production and maintain or increase prices and profits.
- Like collusion, cartels are illegal in the United States.

Conditions necessary for a cartel to be stable (maintainable):

- **There are few firms in the industry.**
- **There are significant barriers to entry.**
- **An identical product is produced.**
- **There are few opportunities to keep actions secret.**
- **There are no legal barriers to sharing agreements.**

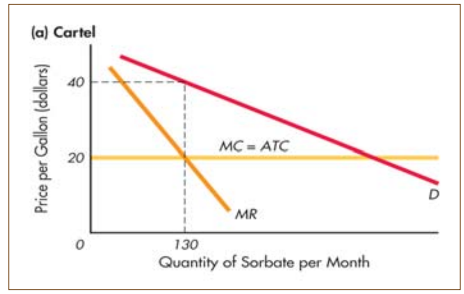
OPEC as an Example of a Cartel

- **OPEC**: Organization of Petroleum Exporting Countries.
- Attempts to set prices high enough to earn member countries significant profits, but not so high as to encourage dramatic increases in oil exploration or the pursuit of alternative energy sources.
- Controls prices by setting production **quotas** for member countries.
- Such cartels are difficult to sustain because members have large incentives to cheat, exceeding their quotas.

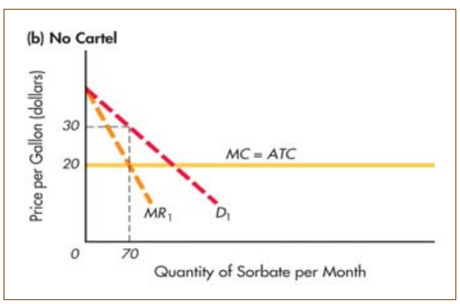
The Diamond Cartel

- In 1870 huge diamond mines in South Africa flooded the gem market with diamonds.
- Investors at the time wanted to control production and created De Beers Consolidated Mines, Ltd., which quickly took control of all aspects of the world diamond trade.
- The Diamond Cartel, headed by DeBeers, has been extremely successful. While other commodities' prices, such as gold and silver respond to economic conditions, diamonds' prices have increased every year since the Depression.
- This success has been achieved by DeBeers' influence on the supply of diamonds, but also via the cartel's influence on demand.
- In the 1940s DeBeers' instigated an advertising campaign making the diamond a symbol of status and romance.

Behavior of a Cartel: Firms Agree to Act as a Monopolist



Cartel: Firms Act Alone



Cartels and Technological Change

- Cartels <u>can be destroyed</u> by an outsider with technological superiority.
- Thus, cartels with high profits will provide incentives for significant technological change.

Facilitating Practices

- **Facilitating practices** are actions by oligopolistic firms that can contribute to cooperation and collusion even thought the firms do not formally agree to cooperate.
- **Cost-plus or mark-up pricing** is a pricing policy whereby a firm computes its average costs of producing a product and then sets the price at some percentage above this cost.