

## Oligopoly

**Oligopoly** – A market structure in which only a few sellers offer similar or identical products

- Actions of any one seller in the market can have a large impact on the profits of all the other sellers
  - Interdependent

**Game Theory** – The study of how people behave in strategic situations

- Profit depends on how much firm produces AND how much other firms produce
  - Small number of players interact with one another

### **MARKETS WITH ONLY A FEW SELLERS**

Key feature is tension between cooperation and self-interest

- Oligopolists are best off when they cooperate and act like a monopolist
  - Produce small quantity of output and charge a price above marginal cost
  - Each oligopolist cares about its own profit → incentives that hinder cooperative outcome

### **A Duopoly Example**

**Duopoly** – An oligopoly with two members

- Simplest type of oligopoly

### **Competition, Monopolies, and Cartels**

**Collusion** – An agreement among firms in a market about quantities to produce or prices to charge

- Market is served by a monopoly → outcome maximizes total profit gained

**Cartel** – A group of firms acting in unison

- Must agree on total level of production and amount produced by each member
- Each cartel member wants larger share, because it means larger profit

### **The Equilibrium for an Oligopoly**

Oligopolists would like to form cartels and earn monopoly profits, but that is often impossible

- arguments on how to divide can make agreements among members difficult
- If duopolists individually pursue their own self-interest when deciding how much to produce, they produce a total quantity greater than the monopoly quantity
  - Charge price lower than monopoly price, earn profit lower than monopoly profit

- **Nash Equilibrium** – A situation in which economic actors interacting with one another each choose their best strategy given the strategies that all the other actors have chosen
  - Neither has an incentive to make a different decision
  - If one firm is producing x quantity it is best for another firm to produce x
    - Would be better of cooperating but pursue self-interest

\*When firms individually chose production, produce output larger than level produced by monopoly and smaller than level produced by competition

- Less than monopoly price but greater than competitive price (MC)

### How the Size of an Oligopoly Affects the Market Outcome

How does an increase in number of sellers affect price and quantity?

- Cartel would once again try to maximize total profit by producing monopoly quantity and charging monopoly price
  - Reaching and enforcing agreement becomes harder as members increase
  - Might need to decide on their own
- Each member must consider two things
  - **Output Effect** – Price is above marginal cost, selling one more gallon of water at going price will raise profit
  - **Price Effect** – Raising production will increase total amount sold, lower the price of water and lower the profit on other gallons sold
- If output effect is larger than price effect, well owner will increase production
- If price effect is larger than output affect, owner will not raise production
  - Oligopolist continue to increase production until two marginal effects balance

\*As number of sellers in an oligopoly grows larger, an oligopolistic market looks increasingly like a competitive market. The price approaches marginal cost, and the quantity produced approaches the socially efficient level

### THE ECONOMICS OF COOPERATION

Problems that arise when cooperation among actors is desirable but difficult

- **Prisoners' Dilemma** – A particular “game” between two captured prisoners that illustrates why cooperation is difficult to maintain even when it is mutually beneficial

#### The Prisoners' Dilemma

- 2 prisoners: Bonnie and Clyde
  - Police has evidence for small 1 year crime and no hard evidence for major 20 year crime
  - Place in separate rooms and offer a deal

Prisoners' dilemma		prisoner B	
		confess	remain silent
prisoner A	confess	 5 years    5 years	 0 year    20 years
	remain silent	 20 years    0 year	 1 year    1 year

- Either get locked up for 1 year or implicate your partner for large crime and go free
  - Depends on strategy chosen by prisoner and partner
- Dominant Strategy** – A strategy that is best for a player in a game regardless of the strategies chosen by the other players
- Confess and other remains silent: 1 year jail
  - Confess and other confesses: 8 year jail (as opposed to 20)
- Both outcomes better to confess and both Bonnie and Clyde confess
- If both had remained silent then only 1 year jail
  - Cooperation between two is difficult to maintain because cooperation is individually irrational

### Oligopolies as a Prisoner's Dilemma

The oligopolists game is similar to the two prisoners' dilemma

- Both choose dominant strategy and produce more than might have been agreed upon
    - Result is inferior outcome with low profits for each of the two producers
  - Monopoly outcome is jointly rational for the oligopoly
- But each oligopolist has incentive to cheat

### Other Examples of the Prisoners' Dilemma

Two examples in which self-interest prevents cooperation and leads to an inferior outcome for the parties involved

#### Arms Races

World Super power – Soviet Union and America were engaged in a prolonged competition over military power

- Arms race was much like the prisoners' dilemma
  - Decision whether to build new weapons or disarm
- Each country preferred to have more arms because larger arsenal would give them more influence in world affairs
  - Also prefer to live in a world safe from other country's weapons
- Each country takes dominant strategy because of self-interest
  - Inferior outcome with both countries at risk

#### Common Resources

People tend to overuse common resources

		Exxon's Decision	
		Drill Two Wells	Drill One Well
Texaco's Decision	Drill Two Wells	Exxon gets \$4 million profit Texaco gets \$4 million profit	Exxon gets \$3 million profit Texaco gets \$6 million profit
	Drill One Well	Exxon gets \$6 million profit Texaco gets \$3 million profit	Exxon gets \$5 million profit Texaco gets \$5 million profit