Imperfect Competition

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Lesson 1: General Equilibrium

Partial Equilibrium

- Explain behaviors:
  - **Partial equilibrium**: The process of examining the equilibrium conditions in individual markets and for households and firms separately.
    - Example: Fix the demand-side, what is a firm's competition strategy in the cola industry in the U.S.?
    - Example: Fix the supply-side, how does one's health impact his or her wage, assume the wage rate is given?
  - In the chapter 3, we talked about "equilibrium": The condition that exists when quantity supplied and quantity demanded are equal, $Q_d = Q_s$
  - **General equilibrium**: The condition that exists when all markets in an economy are in simultaneous equilibrium.

Market Adjustment to Changes in Demand: Example

- Market experiences changes that could shift demand curve:
  - Income and wealth changes;
  - Price of other goods change;
  - Preference changes;
  - Household's expectation changes;
  - Introduce new technology;
- Before, we looked at how these changes affect one market, but these markets are connected to one another.
- Ex: In 2007, Amazon introduced the Kindle, the first e-reader. How does it impact the printed book's market?

Example

- Before 2007, the printed book's market achieved an equilibrium with P^* and Q^*.
- After 2007, printed books could be substituted by e-readers, so the demand for printed books ↓ ⇒ Price of a printed book on average ↓
- Book stores, like Barnes & Noble, might suffer loses
  - ⇒ Demands for the paper ↓
- Shipping services, like UPS, might lose business.
- If Barnes and Nobel responds to lower prices of printed books, then it will influence the optimal price of the Kindle.
- Amazon will respond to that to adjust the price of the Kindle...
- In general equilibrium analysis, one needs to work through all the feedback loops and connections across industries.
 - The tool of the GE analysis: graphs.

General Equilibrium

- There are tons of products in the world, so there are a lot of markets. We might have to draw the demand curves and supply curves for million markets. However, to simplify our analysis, I just draw curves for two markets.
- X (Dietary supplements Industry) and Y (Other industries).
- Before 2019, firms in the industry X and Y all achieved long-run equilibrium.
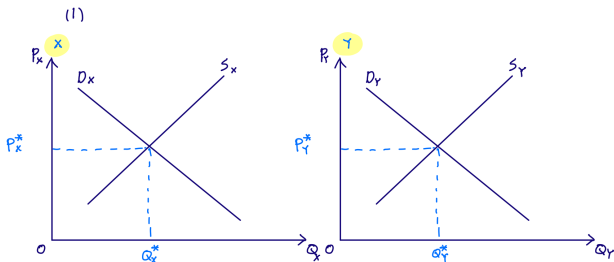
General Equilibrium

- After 2019, consumer awareness for the health is increased by the event of covid-19.
- This event caused demands for supplements (X) increasing.
- Assume: Each household's income does not change, and no one save money. Hence, we want to make sure BC holds: $P_X X + P_Y Y = Income$
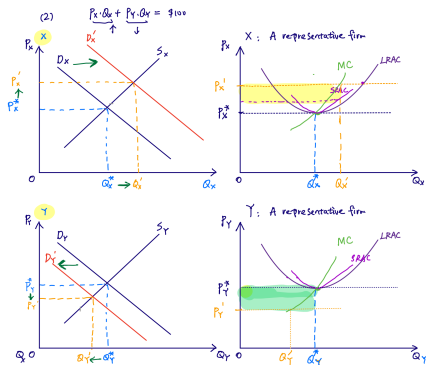
General Equilibrium

- Firms in the industry X and Y will respond to these price change.
- Eventually, X and Y will achieve equilibrium again at P^*.
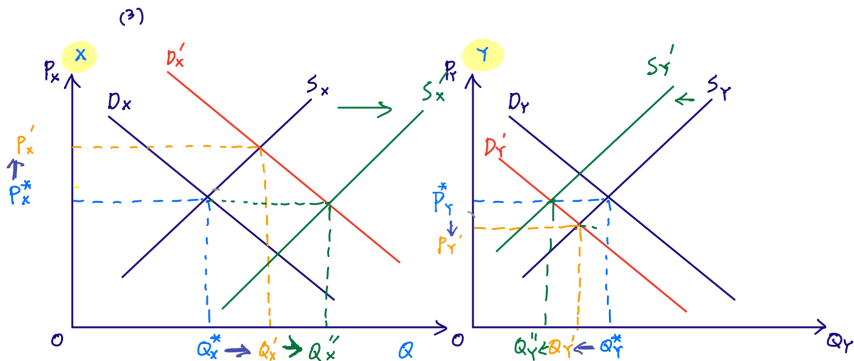
Perfect Competition

- So far, we discuss the perfect competition markets in both output and inputs.
    1. Households: $\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$, s.t: $P_X Q_X + P_Y Q_Y = I$
    2. Firms:
    3. (Output):
        - Short-run: $P = MC$
        - Long-run: $P = MC = SRAC = LRAC$
    4. (Input)
        - Labor: $MRP_{labor} = wage$
        - Land: $MRP_{land} = rent$
        - Capital: $MRP_{capital} = r$
- The general equilibrium in a perfect competition market system: Competitive equilibrium.
- In macroeconomics, you always see the general equilibrium analysis, and the competitive equilibrium model.

Competitive Equilibrium

The allocation (Q, K, L) and prices (w, rent, r, P) constitutes a Competitive equilibrium if the following conditions are satisfied:

- Household's utility maximization problem:

$$\max_{Q_d} U(c_t, L^D)$$

- Subject to the budget constraint:

$$c_t + K_{t+1} = (1 + r) \times K_t^S + w \times L^D$$

- Firm's profit maximization problem:

$$\max_{Q_s} P \times Q_s - w \times L^S - r \times K_t^D$$

- Equilibrium: $\underbrace{Q^D = Q^S}_{\text{Goods market}}$; $\underbrace{L^D = L^S}_{\text{Labor market}}$; $\underbrace{K^D = K^S}_{\text{Capital market}}$

Perfect Competition Market

- Assumptions for the perfect competition market:
    1. All firms and households are price-takers in output markets and input markets;
    2. All firms and households have perfect information about product characteristics, available prices;
    3. No externalities.
- If the assumption 1 fails, then we will change from perfect competition market to Imperfect competition market
    - Monopoly
    - Oligopoly
    - Monopolistic competition
- If the assumption 2 fails, then we will change to a uncertainty world with imperfect information:
    - Adverse selection
    - Moral hazard

Efficiency

- Goal: Evaluate the performance of a economic system.
- 4 criteria: Efficiency; Equity; Growth; Stability.
    - **Efficiency**: means allocate efficiency. The condition in which the economy is producing what people want at least possible cost.
    - No waste.
- In a one-person world, there is no transaction costs, so there is no inefficient.
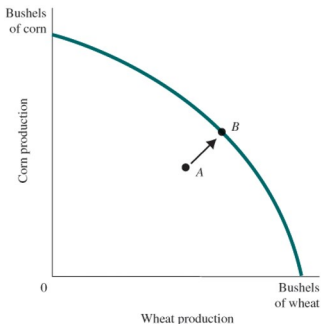
Pareto Efficient

- **Pareto Efficient/condition**: A condition in which no change is possible that will make some one better off without making others worse off.
- Questions: What do we mean by "better off"?
- Example: In a neighborhood, there are totally 3 families A, B, and C. All of them want a park in the neighbor.
    - Case 1: Family B and C do not fund the park. Family A funds the park. Family A feels terrible.
    - Case 2: Family A, B, and C fund the park together.
- If an economic system satisfies Pareto condition, then it is efficient.

Exercise: Perfect Competition Markets

- Event: Introduce a new cheap coffee machine.
- Before this event happened, the coffee market achieved an equilibrium at ($P_c^* = \$10, Q_c^* = \$50$); the tea market achieved the other equilibrium at ($P_t^* = \$5, Q_t^* = \$40$)
- After this event, demands for coffee increased.
  1. Given that tea is a substitute for the coffee, could you predict how the demand for the tea change?
  2. Could you draw the following graphs to show me how two markets achieve new equilibrium after the event?
  3. Demand curves, supply curves, equilibrium points in two markets before the change.
  4. Draw the new demand curves for two markets after the change, denote new prices as $P_c^{'}$ and $P_t^{'}$, new quantities as $Q_c^{'}$ and $Q_t^{'}$.
  5. For the coffee/tea, please Draw a representative coffee firm's MC curve, LRAC curve, SRAC curve at price $P_c^{'}/P_t^{'}$.
  6. Draw new supply curve, and point out the equilibrium quantity at ($P_c^* = \$10, P_t^* = \$5$).

Market Failure

- **Market failure** occurs when resources are misallocated, or allocated inefficiently. The result is waste or lost surplus.
    1. Imperfect competition, or noncompetitive behavior;
    2. The existence of public goods;
        - **Public goods**: Goods that are nonrival in consumption and their benefits are nonexcludable.
    3. The presence of external costs and benefits;
        - **Externality**: Actions of one party impose costs or benefits on a second party.
    4. Imperfect information.
        - **Imperfect information**: The absence of full knowledge concerning product characteristics, available prices, and so on.
- Each condition results from the failure of one of the assumptions basic to the perfectly competitive model.
- Each also points to a potential role for government in the economy.

Lesson 2: Imperfect Competition and Market Power

Review: Perfect competition market

- Perfect competition market
    - All firms are price-taker, and each firm provides homogeneous goods;
    - If we define profit = Total revenue - accounting costs, then the profit is 0. (P = MC)
    - Firms and households have perfect information about goods.
   - All firms could free-entry and free-exit.

Imperfect competition market

- Imperfect competition market
    - Individual firms have some control over the price of their output, and firms provide differentiated products.
    - Firms are price makers and have market power, which means firm's ability to raise price without losing all of the quantity demanded for its product.
- Example: Now one farmer–Bill, sells sweet corn. The other nine farmers still sell non-sweet corn at $P = \$1$. Bill charges a slightly higher price $P_{Bill} = \$1.1$. Do you think Bill could sell any corn now? If so, why is Bill able to control the price?

Forms of Imperfect Competition

1. **Monopoly**: is an industry with **a single firm** in which the entry of new firms is blocked.
   - **Pure monopoly**: An industry with a single firm that produces a product for which there are no close substitutes and in which significant barriers to entry prevent other firms from entering the industry to compete for profits.
2. **Oligopoly**: is an industry that has a small number of firms, each large enough so that its presence affects prices.
3. **Monopolistic competitors**: Firms that differentiate their products in industries with many producers and free entry.

Imperfect Competition and Market boundaries

- The more broadly we define the industry, the fewer substitutes there are; the less elastic the demand for that industry's product is likely to be.
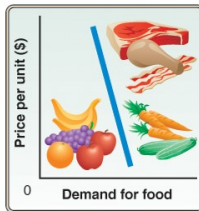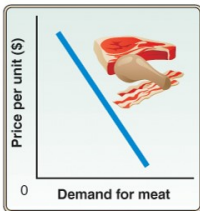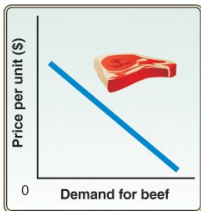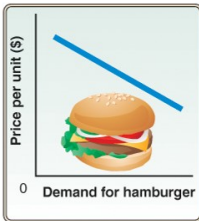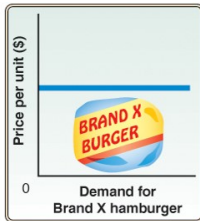
Lesson 3: Monopoly

Example: Monopoly

1. In 1911 the U.S. Supreme Court found that Standard Oil of New Jersey, the largest oil company in the U.S., was a monopoly and ordered that it be divided up.
2. In 1999, Microsoft was found to exercise market power and was asked to change a series of business practices.
3. From 2010-2013, Federal Trade Commission investigated whether Google possessed monopoly power.
4. A history of U.S. monopoly

- Why might the government and the courts try to control monopolists?

Monopoly Market

- Question: What kind of decisions should a monopolist make in the output market?
    1. Searching for a optimal price
    2. Choosing the optimal quantity of outputs

- The monopolist is facing with a demand curve, and this firm could:
    1. Choose a high price and low quantity to supply:

$$TR \uparrow = P \uparrow \times Q$$

    2. Choose a low price and high quantity:

$$TR \uparrow = P \times Q \uparrow$$

- Monopolist's decision depends on household's price elasticity of demands.

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Monopoly Market

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If consumers have inelastic demands for the products, it means $|\epsilon_d| < 1$.

$$|\frac{Q_d\%}{P\%}| < 1$$
$$|Q_d\%| < |P\%|$$

Monopolist could set a high price.

Decisions described by Functions

- A monopolist's profit:

$$\pi = TR - C(q) = p(q) \times q - C(q)$$

- If we try to maximize the profit, then we have to take the first-order condition on q:

$$\underbrace{p^{'}(q)q + p(q)}_{MR} = MC(q)$$

- Or we could write it as:

$$p(q) \times [\frac{p^{'}(q) * q}{p(q)} + 1] = MC(q)$$

- Since $p^{'}(q) = \frac{dp}{dq}$, so we have

$$MR = p(q) \times [\frac{dp(q) * q}{dq * p} + 1] = p(q) \times [1 - \frac{1}{|\epsilon|}] = MC(q)$$

Evaluation

- From the above example, we find: The consumer surplus is less when there is market power from the monopolist, compared with the perfect competition market.
- There is a deadweight loss.
- Under this case, monopoly market is inefficient.
- Is it reasonable for the government to regulate the monopoly market all the time?
- Example: If only 500 individuals in a county would like to pay for CDs/records, and all of them only want to buy one singer's CDs. This popular singer could be a monopolist in the local market.
- The singer could set higher prices for her CDs/records.
- However, the singer's market power benefits the society.
- How do we explain the deadweight loss?

Monopoly in the Long Run

- In the perfect competition market, if existed firms earn positive profits, then more new firms will enter in this industry in the long run.
- However, in the monopoly market, it will not happen.
- **Barriers to entry**: Factors that prevent new firms from entering and competing in imperfectly competitive industries.
- Some barriers:
  1. Economies of scale
  2. Patents
  3. Government rules
  4. Ownership of a scarce factor of production
  5. Network effects

Economies of Scale

- The cost advantages associated with size can give rise to monopoly power.
- **Natural Monopoly**: An industry that realizes such large economics of scale that single-firm production of that good or service is most cost-efficient.
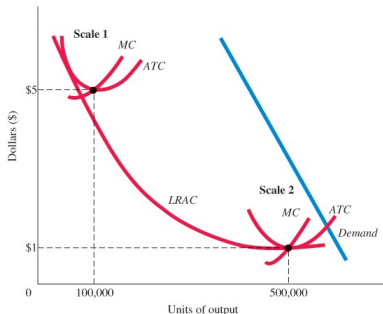

- Providing cable service requires laying expensive cable. Once a firm has laid the wire, providing service to one more customer is inexpensive.

Economies of Scale

- For the natural monopolist, the long-run average cost curve could be declining.

- In the U.S., natural monopolies have been regulated by states. In other countries, natural monopolies are run by the government.

Patents

- **Patents**: A barrier to entry that grants exclusive use of the patented product or process to the inventor.
- Patent protection in the U.S. is currently granted for a period of 20 years from the date the patent application was field.
- Patents provide an incentive for invention and innovation. Why?
- Example: Pharmaceutical industry. (Pfizer)

Patent expires, new firms enter

R&D   Apply for the Patent   Approved by FDA   Patent Drug Manufacturing
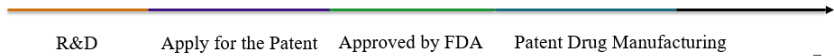
Government Rules

- In some cases, government impose entry restrictions on firms as a way of controlling activity.
- Example: In some states, alcohol is only sold at designated package stores that are operated by government agencies.

Ownership of a scarce factor of production

- Example: You cannot enter the diamond-producing business unless you own a diamond mine. Most of mines are already owned by a single firm, the DeBeers company of South Africa.

- In 2011, Anglo American took control of De Beers, ending the 80-year Oppenheimer control of the company.

Network Effects

- Example: How much value do you get from the Whatsapp?
- It should depend on how many other people also use Whatsapp that can communicate with you.
- Having a large consumer base will increase consumer valuation by encouraging the development of complementary goods.
- **Network externalities**: The value of a product to a consumer increases with the number of that product being sold or used in the market.
- A firm that starts early and builds a large product base will have an advantage over a newcomer.
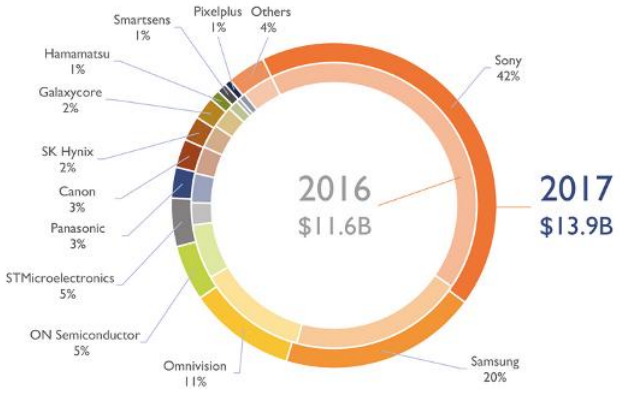
Examples
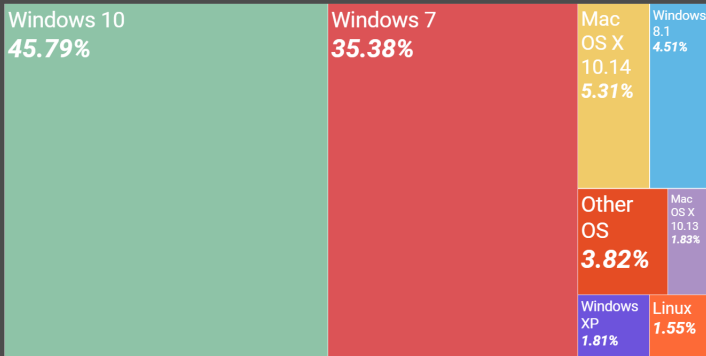
Examples

Inefficiency

- If no large economies of scale exist for the monopoly, the monopolist will charge a high price and produce less outputs.
- What are consequences of high prices charged by a monopolist?
  1. Consumer pay more, and the firm earns more in profits.
  2. High prices distort consumer choice, which then creates an added social loss.
- Example: Pizza sells at its marginal cost MC = \$5 a slice, and your willingness to pay is exactly \$5 (Your marginal use value of one pizza).
- Now, a monopolist sells the same pizza: His/her marginal cost is MC = \$5, but the price is \$7.
  1. Only consumers who valued the slice at \$7 or more would buy.
  2. Consumers whose value is more than \$5 but less than \$7 will not buy and be hungry.
- Monopolist's ability to raise its price above marginal cost means that some transaction that would have been advantageous from an overall society perspective are not made.

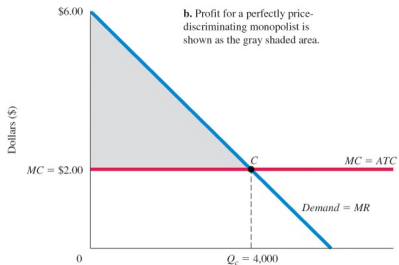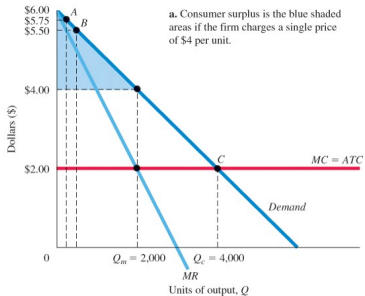# Deadweight-loss

Units of output, Q
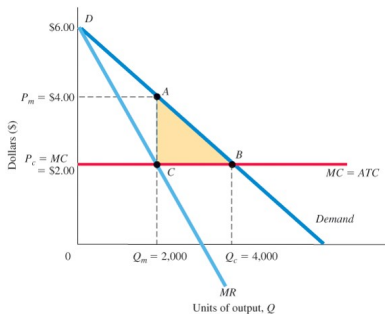
- **Deadweight loss**: The social cost associated with the distortion in consumption from a monopoly price.
- $\triangle ABC$ is a deadweight-loss.
- Draw this graph together.

Price Discrimination

- **Price Discrimination**: Charging different prices to different buyers for identical products, where these price differences are not an inflection of cost differences.
- Example: Movie theaters, hotels, and many other industries routinely charge lower prices for children and elderly people than for others.
- Perfect price discrimination: Occurs when a firm charges the maximum amount that buyers are willing to pay for each unit.
- With price discrimination, the objective of the firm is to segment the market into different identifiable groups, with each group having a different elasticity of demand.
- The optimal strategy for a firm that can sell in more than one market is to charge higher prices in markets with low demand elasticities.
- **No arbitrage condition**: To effectively price discriminate firms must prevent customers from reselling.

Price Discrimination

a. Consumer surplus is the blue shaded areas if the firm charges a single price of $4 per unit.

b. Profit for a perfectly price-discriminating monopolist is shown as the gray shaded area.

Exercise

- The following diagram illustrates the demand and marginal revenue curves facing a monopoly in an industry with no economics or dis-economics of scale. In the short and long run, MC = ATC.
    1. Calculate the value of profit, consumer surplus and deadweight loss. Illustrate these on the graph.
    2. Repeat the calculations in a, but now assume the monopoly is able to practice perfect price discrimination.
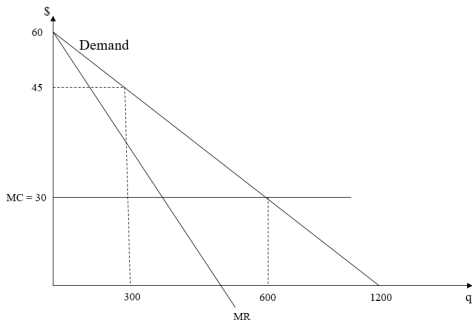
In-Class Quiz for fun

1. Use your electronic devices to search this website: `www.kahoot.it`
2. Pin code
3. Create a nickname for yourself
4. Answer the question

Lesson 4: Oligopoly

Oligopoly: Start with Examples

- In the U.S., 90% of the music produced and sold comes from one of three studios: Universal, Sony, or Warner.

- The competition among these three firms is intense, but most of it involves the search for new talent and the marketing of that talent.
    - **Universal**: Queen, Blackpink, Juice Wrld, Nirvana, Katy Perry, U2.
    - **Sony**: Maneskin, Giveon, Jasmine Sullivan, Beyoncé Knowles, Alan Walker.
    - **Warner**: Ed Sheeran, Madonna, The Rolling stones, Coldplay, Linkin park.

Oligopoly: Start with Examples

- If you were a manager in Sony music group, you try to sign a 10 year contract with a singer–Anna.
- You know Universal's manager–Bob also wants to sign the contract with this singer.
- When you design the wage contract for Anna, you have to consider how Bob will design the wage for Anna. If your offer is higher than Bob's, then Anna would like to sign the contract with you. However, you also do not want to provide an offer which is too expensive for your company.
- Your decision will be influenced by Bob's decision in the oligopoly market. (Interdependence)
- Example: Smartphones
  - Of the 1.3 billion smartphones sold in 2014, more than 50% are sold by one of two firms, Samsung and Apple.

Oligopoly: A special case

- Airlines market
    - Delta, Unites Airlines, American Airlines
    - Airlines companies have some market power to set prices for flight tickets.
    - On the other side, airlines firms are also buyers for airplanes.
    - In the airplanes market, Boeing and Airbus control almost the entire market for commercial airplanes.
- When a firm with market power faces another firm with the market power in the input market, bargaining dynamics help determine who ends up with the profits.

Five Forces Model

- Five forces model help to explain the relative profitability of an industry and identify in which area firm rivalry is likely to be most intense.
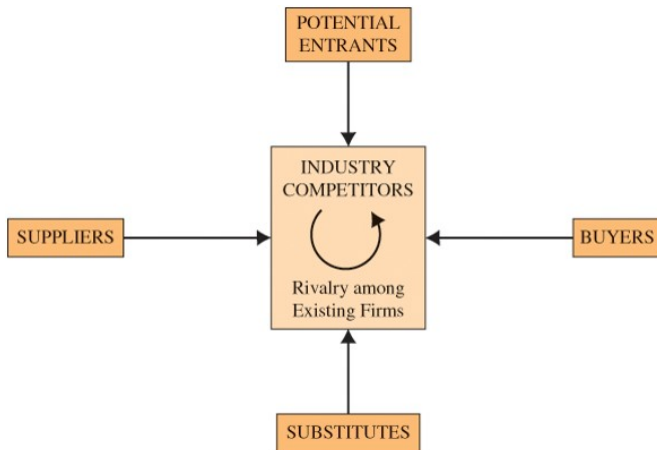
Market Structure

- To analyze an industry, we start with several questions
    1. How many firms in this industry?
    2. Do the top two firms have 90% of the market or only 20%?
    3. If so, what is the top two firms concentration ratio?
        - *Concentration ratio*: The share of industry output in sales or employment accounted for by the top firms.
    4. Are the firms all making the same product, or are the products different from one another?
        - The more differentiated products made by oligopolists are, the more their behavior will resemble that of the monopolist.
    5. Is it easy for new firm to enter this industry? Is it easy for existed firm to exit this industry?
        - Potential entrants $\Rightarrow$ Low entry barriers $\Rightarrow$ New firms compete away excess profits that existed firms earn (why?)
        - *Contestable markets*: Markets in which entry and exit are easy enough to hold prices to a competitive level even if no entry actually occurs.

Government

- The large oligopoly firms might have incentive to push small firms out of the market by buying up or merging with the small firms.
- **Merge**: A merger is an agreement that unites two existing companies into one new company.
- The government tries to control mergers because it might "substantially lessen competition in an industry".
- How to measure the "competition levels" in an industry?
- **Herfindahl-Hirschman Index**: An index of market concentration found by summing the square of percentage shares of firms in the market.

HHI
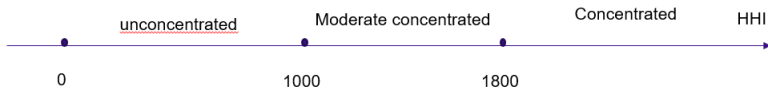
| Percentage Share of:					
	Firm 1	Firm 2	Firm 3	Firm 4	**Herfindahl-Hirschman Index**
Industry A	50	50	—	—	$50^2 + 50^2 = 5,000$
Industry B	80	10	10	—	$80^2 + 10^2 + 10^2 = 6,600$
Industry C	25	25	25	25	$25^2 + 25^2 + 25^2 + 25^2 = 2,500$
Industry D	40	20	20	20	$40^2 + 20^2 + 20^2 + 20^2 = 2,800$

Models

- Many different types of oligopolies exist, so there are different types of oligopoly model to analyze firms' decisions on P and Q.
- **Common:** Interdependent behaviors among oligopoly firms.
- Differences in the models are associated with differences in how we think firms take into account each other's market position and behaviors.
    1. The Collusion model
    2. The Price-leadership model
    3. The Cournot model

The Collusion model and Cartel

- The intuition behind the collusion:
    - A monopoly firm is able to raise the price without losing the quantity demanded. $\Rightarrow$ Obtain more profits by letting consumers pay more than what they should have paid.
    - Oligopoly firms also want to be a monopoly.
    - These firms get together and agree to cut production and increase price.
    - If firms can agree **not** to price compete, they will have a bigger total-profit pie to carve up.
    - When a group of profit-maximizing oligopolists colludes on price and output, the result is the same as it would be if a monopolist controlled the entire industry. (Q satisfy MR = MC)
- A group of firms that get together and makes price and output decisions jointly is called a **cartel**.

Example for the Cartel: OPEC

- OPEC (Organization of Petroleum Exporting Countries): consists of 13 countries, and they produced oil together.
- In 1970, the OPEC began to cut pretroleum production.
- From 1973 to 1974, it led to a 400 percent increase in the price of crude oil in world market.
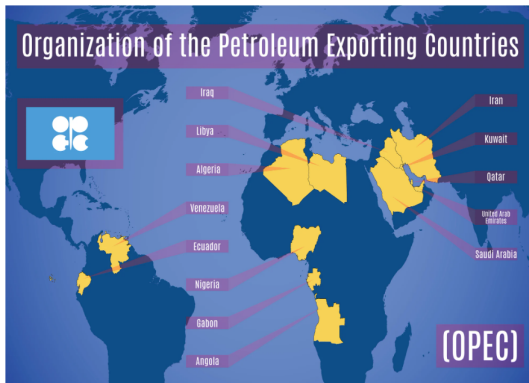
AN EVEN SHORTER MAP OF THE OPEC COUNTRIES. IMAGE SOURCE: GETTY IMAGES.

Cartel

- All agreements aimed at fixing prices or output levels, regardless of whether the resulting prices are high or are illegal.
- Cartels are illegal under U.S. antitrust law.
- For a cartel to be effective in raising prices, a set of conditions must be present.
    1. Demand for the cartel's product must be inelastic.
    2. All members of cartel must play by the rules of that cartel.
        - If a cartel is holding up prices by restricting output, there is a big incentive for members to cheat by increasing output.
    3. Entry into the industry by non-cartel members must also be difficult.
- **Tacit collusion**: Collusion occurs when price-fixing and quantity-fixing agreements among producers are explicit. Tacit collusion occurs when such agreements are implicit.

The Cournot Model

- The model is introduced in the 19th century by the mathematician Antoine Augustin Cournot.
- It tries to answer: How might a firm take its rival's behavior into account when making its own decisions, when two firms producing identical goods?

The Cournot Model

- Suppose: Sony and Warner are only two firms in the music market. Assume, music from two companies are almost the same. They need to decide the amount of music (quantity) to supply this year.

- Sony: q_{sony}, and marginal cost to produce one music is $c_{\text{sony}} = \$100$, so Sony's profit equation is:

$$\max_{q_{\text{sony}}} P \times q_{\text{sony}} - 100 \times q_{\text{sony}}$$

- Warner: q_{warner}, and marginal cost to produce one music is $c_{\text{warner}} = \$50$, so Warner's profit equation is:

$$\max_{q_{\text{warner}}} P \times q_{\text{warner}} - 50 \times q_{\text{warner}}$$

- where

$$P = 500 - (q_{\text{warner}} + q_{\text{sony}})$$

The Cournot Model

$$P = 500 - (q_{\text{warner}} + q_{\text{sony}})$$

- Now, we are in the oligopoly market, so Sony and Warner are all price-searchers, or price markers.
- If you were the owner of Warner, you know that: As Sony produce more and more music, P $\downarrow$. It will lower your profits.
- Sony's owner also know it. So, when Warner and Sony decides q, they need to take the competitor's output into account.
- Hence, the market price depends on the amount of music that you provide, and the amount of music Sony provides.

The optimal q_{warner} and q_{sony}

- For Sony:

$$\max_{q_{\text{sony}}}(500 - (q_{\text{warner}} + q_{\text{sony}})) \times q_{\text{sony}} - 100 \times q_{\text{sony}}$$

- Taking first-order condition on q_{sony}:

$$500 - q_{warner} - 2q_{\text{sony}} - 100 = 0$$

- Hence,

$$q_{\text{sony}}^* = \frac{400 - q_{warner}^*}{2}$$

The optimal q_{warner} and q_{sony}

- For Warner:

$$\max_{q_{\text{warner}}}(500 - (q_{\text{warner}} + q_{\text{sony}})) \times q_{\text{warner}} - 50 \times q_{\text{warner}}$$

- Taking first-order condition on q_{warner}:

$$500 - 2q_{warner} - q_{\text{sony}} - 50 = 0$$

- Hence,

$$q^*_{\text{warner}} = \frac{450 - q^*_{sony}}{2}$$

- Given that $q^*_{\text{sony}} = \frac{400 - q_{warner}}{2}$, we could solve the optimal quantity:

$$q^*_{\text{warner}} = \frac{450 - q^*_{sony}}{2} = \frac{450 - \frac{400 - q^*_{warner}}{2}}{2}$$

- $q^*_{\text{warner}} \approx 167$, $q^*_{\text{sony}} \approx 117$, P = \$216.

Game Theory Prisoners' Dilemma

- *Setting*: We put two prisoners in two separate rooms, and ask them questions at the same time. They could not communicate.
- If we look at the payoff matrix, then we find two players have symmetric payoffs.
- *Lemma*: In a game with symmetric payoffs, two players play the same strategy.
- In this example, "admit" is the dominant strategy for each player.
- Nash equilibrium: (Admit, Admit).
- What if prisoners move in a sequence?

Players		Prisoner 2	
	Actions	Cooperate (deny)	Defect (admit)
Prisoner 1	Cooperate (deny)	5, 5	-1, 6
	Defect (admit)	6, -1	0, 0

What if prisoners move in a sequence?

- Suppose: We ask Prisoner 1 questions firstly. Then we tell prisoner 2 what prisoner 1 did, and ask prisoner 2 to make the decision.
- What is the dominant strategy now? What is the Nash equilibrium?
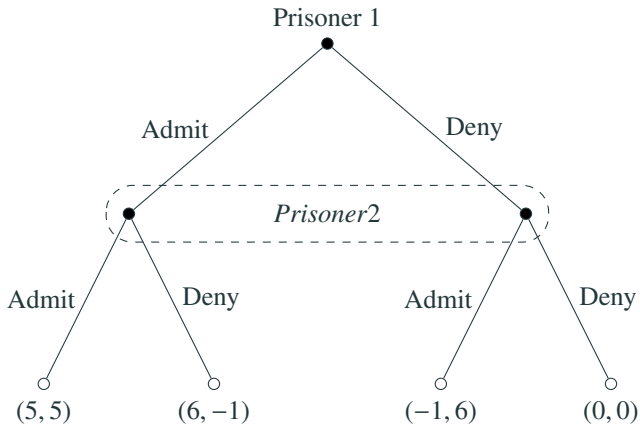
What if prisoners move in a sequence?

- **Normal form game**: The game when all players move simultaneously.
- **Extensive form game**: The game in which players move in sequence, and the second player could fully observe the first player's action.
  - To solve the extensive form game, we need to use Backward induction method.
- **Repeated game**: Games that are not played once.
- **Bayesian game**: When players do not know all relevant information about each other, they have to form beliefs about other players, and then play the game. This type of games is Bayesian game.

What if prisoners move in a sequence?

- Goal: Find each player's best strategy given that they all try to maximize their payoffs.
- Backward induction says: We should start our analysis from the latter-mover: Prisoner 2.
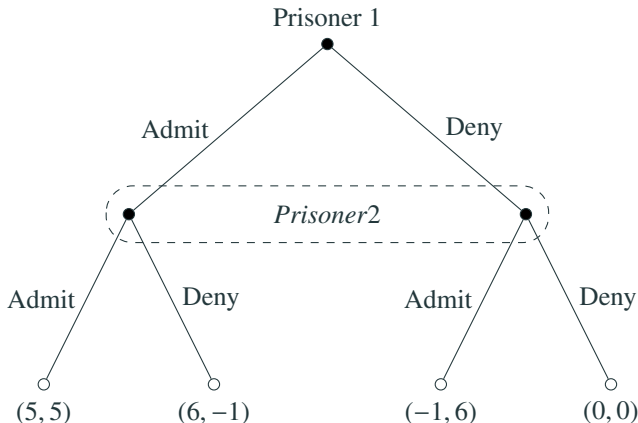
Prisoner 2 (She) might think:

- If Prisoner 1 (He) chooses "Admit", then she should choose "Admit" because $5 > -1$
- If Prisoner 1 (He) chooses "Deny", then she should choose "Admit" because $6 > 0$
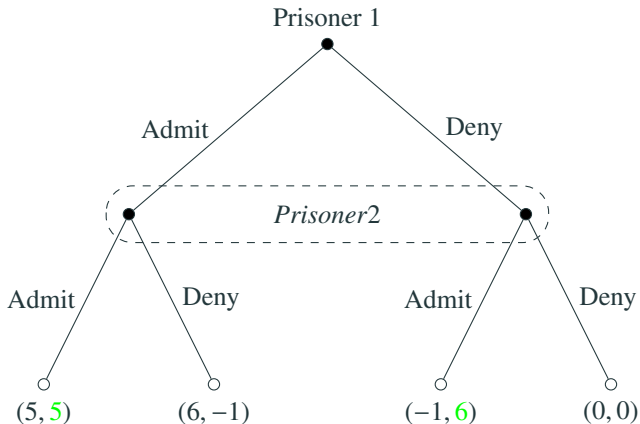
Prisoner 1 (He) might think:

- Prisoner 1 knows that Prisoner 2 always play "admit" no matter what he plays. Given Prisoner 2 will always play "admit", prisoner 1 knows that possible outcomes change from 4 to 2. He will choose "admit" given that $5 > -1$.
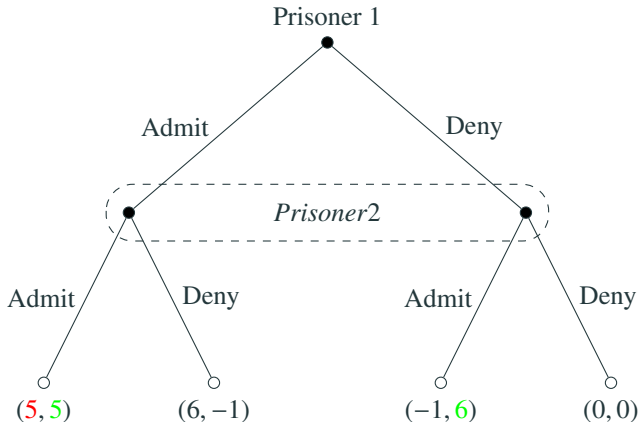
Lesson 5: Monopolistic Competition

Monopolistic Competition

- Example: There are totally 721 firms in the U.S. toy industry, and top 4 firms occupy only 34% market shares.
- Question: Is toy's industry a perfect competition market, or monopoly market, or an oligopoly market?

Monopolistic Competition

- Perfect competition:
  - Many firms in the market;
  - All firms provide homogeneous goods;
  - Price-taker.

- Monopoly:
  - One firm in the market;
  - It is almost impossible for other firms to entry
  - Price-maker.

- Oligopoly:
  - Few firms in the industry;
  - Few firms could try the market price
  - Firms decisions are interdependent.

Monopolistic Competition

- A monopolist competitive industry has the following characteristics:
  1. A large number of firms
  2. No barriers to entry
  3. Product differentiation
- *A situation in which each seller carries goods that have some unique properties in the view of the consumer (brand names, special ingredients, accompanying customer services, etc.) so that the seller may be considered to have a partial monopoly.*

Monopolistic Competition

- Example: Restaurants on a street.
  - No one is big enough to affect the market price.
  - Restaurants could gain control over price by differentiating their products.
  - Intuition: The restaurant either produces a product that people want that others are not producing, or establish a reputation for good food and good services, or create a unique identity in the minds of consumers.

How do firms differentiate products?

- **Horizontal differentiation**: Products differ in ways that make them better for some people and worse for others.
  - Example: McDonald's new Cilantro Sundae.
- **Vertical differentiation**: A product difference that, from everyone's perspective, makes a product better than rival products.
  - Example: Hilton is better than Motel 6.

## Advertising: Pros and Cons

- Could you evaluate this advertisement from these aspects?
    1. If you were Amazon's CEO, you know most American will watch the super bowl, do you plan to purchase the Ad position during the super bowl?
    2. If you were a small firm's owner, do you plan to purchase this Ad position during the super bowl?
    3. If you were a consumer, would you like to buy this product? Do you have concerns about the price?

Advertising: Pros and Cons

- **Pros**: Advertising could inform people about the real differences that exist among products; and create product differentiation.

- **Cons**: Product differentiation and advertising could waste society's scarce resources.
    - Do we really need different kinds of soap, some of whose prices are increased by the cost of advertising?
    - "The price of a Super Bowl commercial in 2022 hit a new peak as multiple companies paid $7 million for a 30-second spot."
    - Advertising raises the cost of products and frequently contains little information.
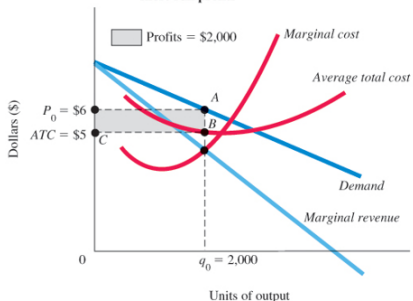
Demand Curves

- The demand curve that a monopolistic competitor faces is likely to be less elastic than the demand curve that a perfectly competitive firm faces.
- Demand is more elastic than the demand curve that a monopolist faces because close substitutes for the products of a monopolistic competitor are available.
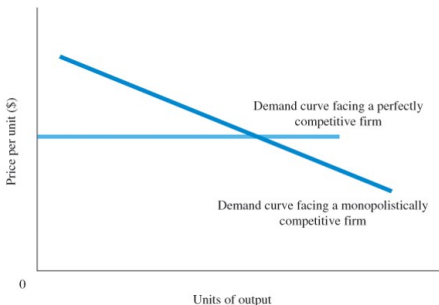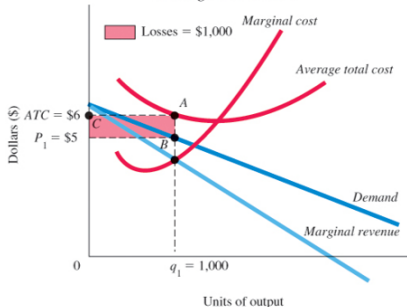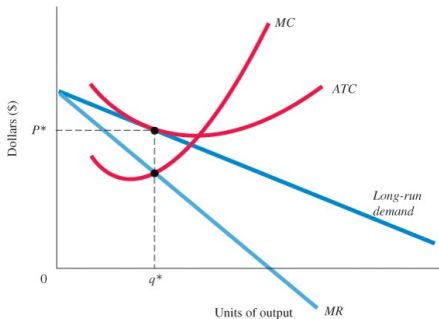
Price/Output Determination

a. A monopolistically competitive firm earning short-run profits

Profits = $2,000

Marginal cost

Average total cost

$P_0 = \$6$

$ATC = \$5$

A

B

C

Demand

Marginal revenue

Dollars ($)

$q_0 = 2,000$

Units of output

0

b. A monopolistically competitive firm suffering short-run losses

Losses = $1,000

Marginal cost

Average total cost

$ATC = \$6$

$P_1 = \$5$

A

C

B

Demand

Marginal revenue

Dollars ($)

$q_1 = 1,000$

Units of output

0

Price/Output Long Run Equilibrium

- As new firms enter a monopolistically competitive industry in search of profits, the demand curves of existing profit-making firms begin to shift to the left, pushing marginal revenue with them as consumers switch to the new close substitutes.

In-Class Quiz for fun

1. Use your electronic devices to search this website: `www.kahoot.it`
2. Pin code
3. Create a nickname for yourself
4. Answer the question