

Principles of Economics

Chapter 15:

Monopoly



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The Big Picture

- ▶ Chapter 13: The cost of production
- ▶ Now, we will look at firm's revenue
 - ▶ But revenue depends on market structure
- 1. Competitive market (chapter 14)
- 2. Monopoly (**this chapter**)
- 3. Monopolistic Competition (chapter 16)
- 4. Oligopoly (chapter 17)
 - ▶ Are there other types of markets? Yes, see more advance courses in IO and firm competition

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In This Chapter

- ▶ Why do monopolies arise?
- ▶ Why is $MR < P$ for a monopolist?
- ▶ How do monopolies choose their P and Q ?
- ▶ How do monopolies affect society's well-being?
- ▶ What can the government do about monopolies?
- ▶ What is price discrimination?

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Why Monopolies Arise

- ▶ Monopoly
 - ▶ A firm that is the sole seller of a product without close substitutes
- ▶ Has market power
 - ▶ The ability to influence the market price of the product it sells: "price maker"
- ▶ Arise due to barriers to entry
 - ▶ Other firms cannot enter the market to compete with it

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Three Barriers to Entry

1. Monopoly Resources

- ▶ A single firm owns a key resource.
 - ▶ Single water provider in town
 - ▶ DeBeers - owns most of the world's diamond mines

2. Government Regulation

- ▶ The government gives a single firm the exclusive right to produce the good.
 - ▶ Patent and copyright laws, rice wine

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Three Barriers to Entry

3. The Production Process: Natural Monopoly

- ▶ A single firm can produce the entire market Q at lower cost than could several firms
- ▶ Arises when there are economies of scale over the relevant range of output
- ▶ Distribution of water, electricity, etc.
- ▶ Note: This is about cost of production!
 - ▶ Not really market structure, so:
 - ▶ Natural monopoly need not result in a monopoly...

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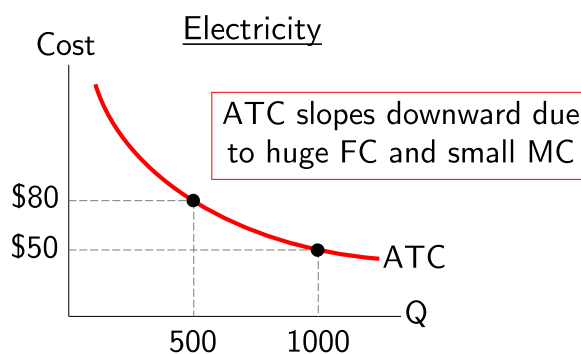
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Example: Natural Monopoly

You live in a small town where 1,000 homes need electricity.

- ▶ **ATC** is lower if one firm services all 1,000 homes than if two firms each service 500 homes.



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Monopoly versus Competition

- ▶ Competitive Firm
 - ▶ Price Taker
 - ▶ Small, one of many
 - ▶ Faces individual demand at **P**: perfectly elastic demand
- ▶ Monopoly Firm
 - ▶ Price Maker,
 - ▶ Has market power
 - ▶ Faces the **entire market** demand: downward sloping demand

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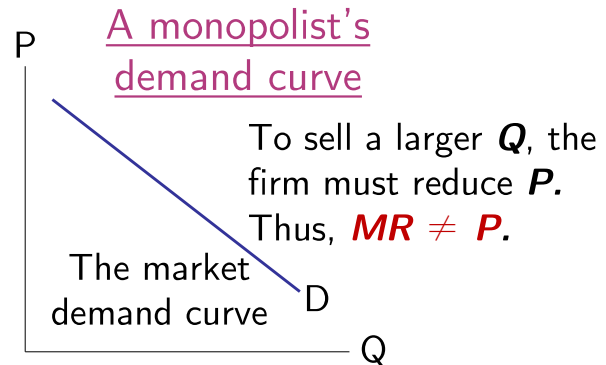
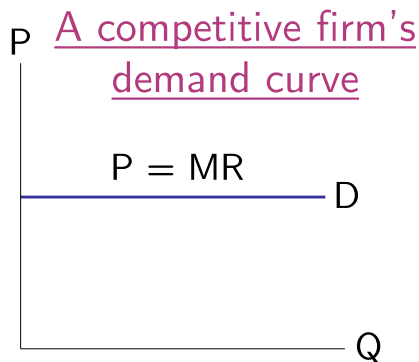
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Demand Curves: Competitive Firm vs. Monopoly

The firm can increase Q without lowering P , so $MR = P$ for the competitive firm.



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Active Learning 1: Hello Café (桌遊去) Revenue

Hello Café (桌遊去) is the only board game place on campus.

The table shows the market demand for game play.

- ▶ Fill in the missing spaces of the table.
- ▶ What is the relation between P and AR ?
- ▶ Between P and MR ?

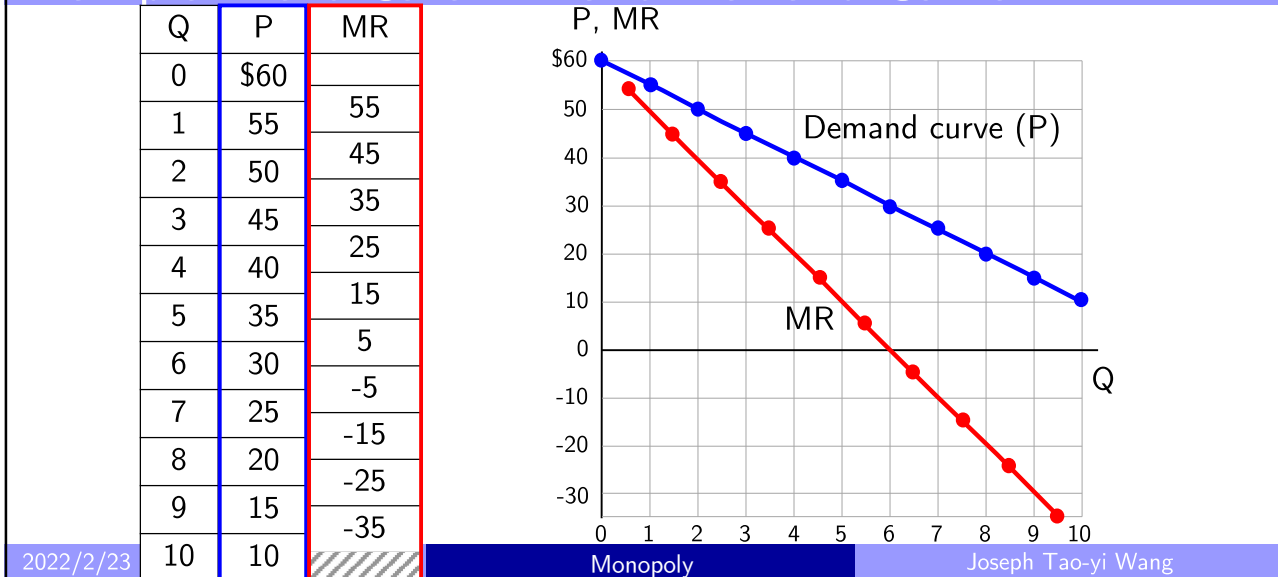


Q	P	TR	AR	MR
0	\$60			
1	55			
2	50			
3	45			
4	40			
5	35			
6	30			
7	25			
8	20			
9	15			
10	10			

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Example: Hello Café MR and Demand Curve



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A Monopolist's Revenue

- ▶ Increasing Q has two effects on revenue:
 - ▶ **Output Effect:** Higher output raises revenue
 - ▶ **Price Effect:** Lower price reduces revenue
- ▶ Marginal Revenue, $MR < P$
 - ▶ To sell a larger Q , the monopolist must reduce the price on all the units it sells
 - ▶ Is negative if price effect $>$ output effect
 - ▶ Ex: If Hello Café increases Q from 6 to 7

Q	TR	MR
0	\$0	
1	55	55
2	100	45
3	135	35
4	160	25
5	175	15
6	180	5
7	175	-5
8	160	-15
9	135	-25
10	100	-35

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Monopoly Profit Maximization

- ▶ Produce Q where $MR = MC$
 - Sets the highest price consumers are willing to pay for that quantity
 - Finds this price on the D curve
 - $P > MR = MC$
 - If $P > ATC$, the monopoly earns a profit

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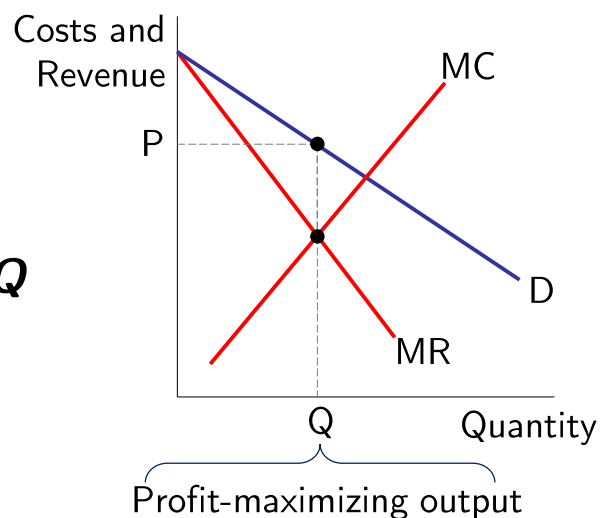
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Profit-Maximization for a Monopoly

At this Q , find P on the demand curve.

The profit-maximizing Q is where $MR = MC$.



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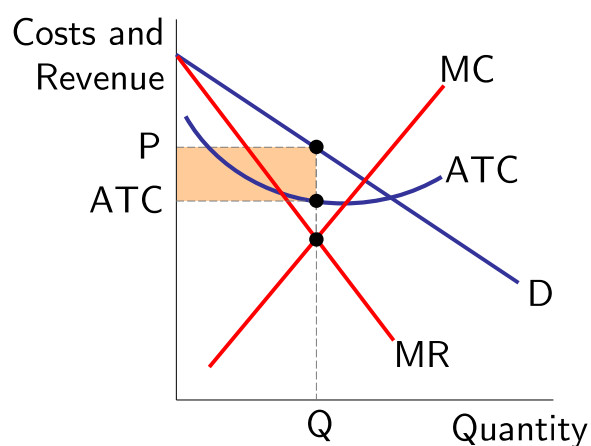
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The Monopolist's Profit

As with a competitive firm, the monopolist's profit equals

$$(P - ATC) \times Q$$



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A Monopoly Does Not Have a S Curve

- ▶ A competitive firm takes P as given
 - ▶ Has a supply curve that shows how its Q depends on P
- ▶ A monopoly firm is a “price-maker”
 - ▶ Q does not depend on P
 - ▶ Q and P are jointly determined by MC , MR , and the demand curve
- ▶ Hence, no supply curve for monopoly.

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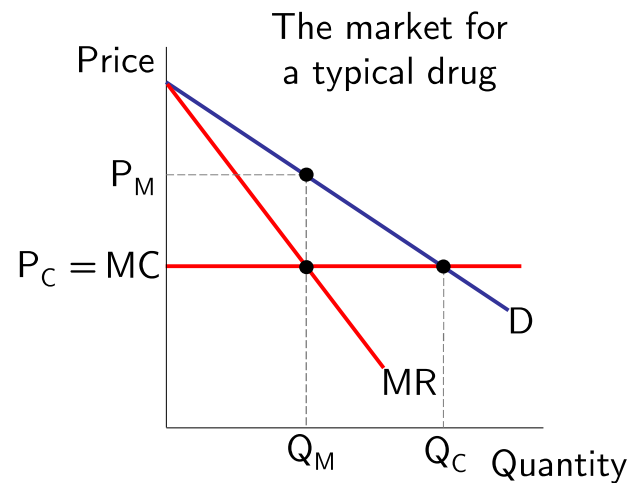
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Case Study: Monopoly vs. Generic Drugs

Patents on new drugs give a temporary monopoly to the seller:

P_M, Q_M

When the patent expires, the market becomes competitive, generics appear: P_C, Q_C



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The Welfare Cost of Monopolies

- ▶ Competitive Market Equilibrium:
 - ▶ At $P = MC$ and maximizes total surplus
- ▶ Monopoly Equilibrium: at $P > MR = MC$
 - ▶ The value to buyers of an additional unit (P) exceeds the cost of the resources needed to produce that unit (MC)
 - ▶ The monopoly Q is too low
 - ▶ Could increase total surplus with a larger Q .
- ▶ Monopoly results in a **deadweight loss**

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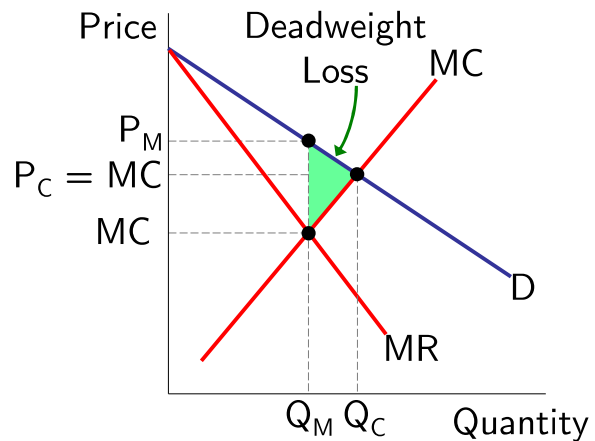
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The Deadweight Loss of Monopoly

- ▶ Competitive Equilibrium:
 - ▶ Quantity = Q_C
 - ▶ $P_C = MC$
 - ▶ Total surplus is maximized
- ▶ Monopoly Equilibrium:
 - ▶ Quantity = Q_M
 - ▶ $P_M > MC$
 - ▶ Deadweight Loss



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The Monopoly's Profit: A Social Cost?

- ▶ Monopoly profit is not in itself necessarily a problem for society
 - ▶ Greater producer surplus for monopoly
 - ▶ Smaller consumer surplus
 - ▶ Transfer of surplus from consumers to monopoly
- ▶ The inefficiency:
 - ▶ Monopoly produces $Q <$ efficient quantity
 - ▶ Deadweight Loss

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Price Discrimination

- ▶ Price Discrimination:
 - ▶ Sell the same good at different prices to different buyers
 - ▶ A firm can increase profit by charging a higher price to buyers with higher willingness to pay
 - ▶ Requires the ability to separate customers according to their willingness to pay
 - ▶ Can raise economic welfare

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Active Learning 2: At the Movies

You are the manager of the only movie theater in town. The price you charge is NT\$180 per ticket, and in a given week you sell $Q = 1,000$ movie tickets. Assume that you incur only a fixed cost of NT\$100,000 in a week.

- A. How much profit is the movie theater making?
- B. If you are dropping the price to NT\$50, you will be able to sell $Q = 2,500$ movie tickets. Calculate the profit.
- C. Suggest a way you can price discriminate when selling movie tickets. Calculate the profit if you price discriminate with $P_1 = \text{NT\$}180$ and $P_2 = \text{NT\$}50$.

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Active Learning 2: Answers

- A. Single price $P = \$180$, $Q = 1,000$, $TC = \$100,000$
- ▶ Total Revenue $TR =$
 - ▶ Profit $=$
- B. Single price $P = \$50$, $Q = 2,500$, $TC = \$100,000$
- ▶ Total Revenue $TR =$
 - ▶ Profit $=$
- C. Price Discrimination: $P_1 = \$180$ and $P_2 = \$50$.
- ▶ Sell P_1 ,
 - ▶ Sell at P_2 ,
 - ▶ Profit $=$

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Perfect Price Discrimination

- ▶ Perfect Price Discrimination
 - ▶ Charge each customer a different price
 - ▶ Exactly his or her willingness to pay
- ▶ Monopoly firm gets the entire surplus (Profit)
- ▶ No deadweight loss

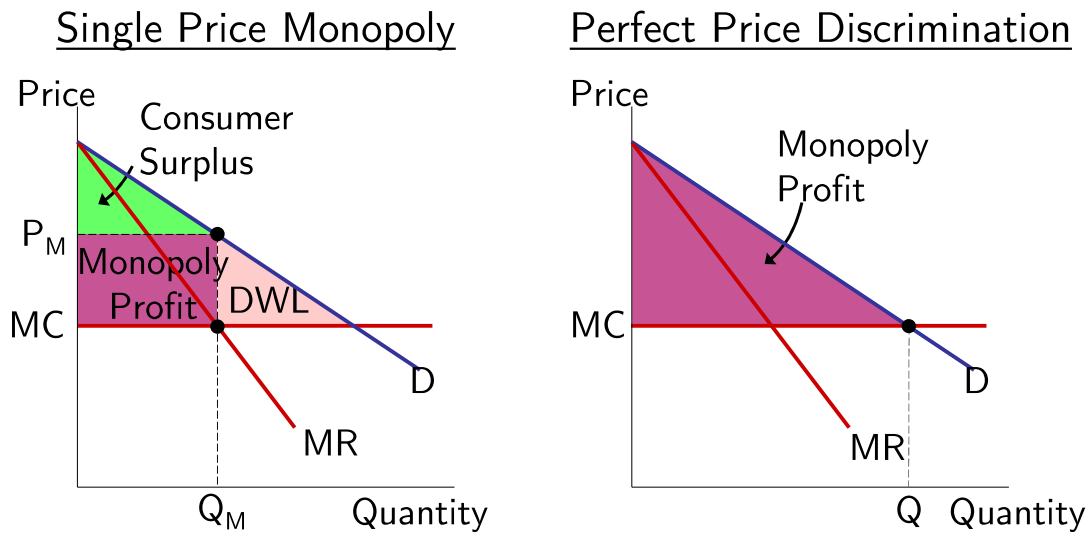
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Welfare With and Without Price Discrimination



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Price Discrimination in the Real World

- ▶ Perfect price discrimination is not possible since
 - ▶ No firm knows every buyer's *WTP*
 - ▶ Buyers do not reveal it to sellers
- ▶ Price Discrimination
 - ▶ Firms divide customers into groups based on some observable trait that is likely related to willingness to pay (*WTP*), such as age

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Example: Price Discrimination

A. Movie Tickets

- ▶ Discounts for seniors, students, and people who can attend during weekday afternoons.
- ▶ Lower *WTP* than people who pay full price on Friday night

B. Airline Prices

- ▶ Discounts for Saturday-night stayovers
- ▶ Business travelers (higher *WTP*) vs. more price-sensitive leisure travelers

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Example: Price Discrimination

C. Discount Coupons

- ▶ People who have time to clip and organize coupons are more likely to have lower income and lower *WTP* than others

D. Need-based Financial Aid

- ▶ Low income families have lower *WTP* for their children's college education
- ▶ Schools price-discriminate by offering need-based aid to low income families

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Example: Price Discrimination

E. Quantity Discounts

- ▶ A buyer's WTP often declines with additional units, so firms charge less per unit for large quantities than small ones.

- ▶ Ex: Vieshow Cinemas charges 全台威秀爆米花價格

NT\$89 for a small popcorn,
NT\$106 for medium one
that's twice as big, and
NT\$115 for a large one
that is thrice as big.

	單點爆米花
台北 信義威秀 / 京站威秀	大杯爆米花 : \$115 中杯爆米花 : \$106 小杯爆米花 : \$89
板橋 大遠百威秀	
林口 三井	
桃園 統領威秀	
新竹 大遠百威秀	
頭份 尚順威秀	
新竹 巨城威秀	

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Public Policy Toward Monopolies

1. Increasing Competition with Antitrust Laws

- ▶ Sherman Antitrust Act, 1890
- ▶ Clayton Antitrust Act, 1914
- ▶ Prevent mergers
- ▶ Break up companies
- ▶ Prevent companies from coordinating their activities to make markets less competitive

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Ask The Experts

Mergers

- ▶ “A merger of AT&T and Time Warner would likely increase consumer surplus over the ensuing decade.”
- ▶ Do you Agree or Disagree?
- ▶ Do you think Economists Agree or Disagree?

Source: IGM Economic Experts Panel, August 28, 2013, November 8, 2016

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Public Policy Toward Monopolies

2. Regulation

- ▶ Set the monopolists' price
- ▶ Common in case of natural monopolies
 - ▶ **MC < ATC** at all **Q**
 - ▶ Marginal-cost pricing would result in losses
- ▶ Regulator might subsidize the monopolist or set **P = ATC** for zero economic profit
- ▶ Problem: no incentive to reduce costs

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Public Policy Toward Monopolies

3. Public Ownership

- ▶ How the ownership of the firm affects the costs of production
 - ▶ Example: USPS, Taiwan CPC, TTL
- ▶ **Private** Owners: incentive to min costs
- ▶ **Public** Owners (government):
 - ▶ If it does a bad job, losers are the customers and taxpayers
 - ▶ Public ownership is usually less efficient since there is no profit incentive to minimize costs

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Public Policy Toward Monopolies

4. Doing Nothing

- ▶ Some economists argue that it is often best for the government not to try to remedy the inefficiencies of monopoly pricing
- ▶ Determining the proper role of the government in the economy requires judgments about politics as well as economics

5. Auction Off the Market (Harold Demsetz)

- ▶ Can use revenue to subsidize consumers
 - ▶ Pigovian Subsidy: Correct for DWL

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The Prevalence of Monopoly

- ▶ Pure monopoly – rare in the real world
- ▶ Many firms have market power, due to:
 - ▶ Selling a unique variety of a product
 - ▶ Having a large market share and few significant competitors
- ▶ In many such cases, most of the results from this chapter apply, including:
 - ▶ Markup of price over marginal cost
 - ▶ Deadweight Loss

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Competition versus Monopoly

	Competition	Monopoly
Similarities	Goal of firms	Maximize profits
	Rule for maximizing	MR = MC
	Can earn economic profits in SR?	Yes
	Number of firms	Many
Differences	Marginal revenue	MR = P
	Price	P = MC
	Produces welfare-maximizing Q?	Yes
	Entry in the LR?	Yes
	Can earn economic profits in LR?	No
	Price discrimination possible?	No

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Ask The Experts

Mergers

- ▶ “If regulators had not approved mergers in the past decade between major networked airlines, travelers would be better off today.”

▶ Do you Agree or Disagree?

- ▶ Do you think Economists Agree or Disagree?

Source: IGM Economic Experts Panel, August 28, 2013, November 8, 2016

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Think-Pair-Share

A Consumer Advocate is Discussing the Airline Industry

...on the news. He says, “There are so many rates offered by airlines that it is technically possible for a 747 to be carrying a full load of passengers where no two of them paid the same price for their tickets. This is clearly unfair and inefficient.”

- ▶ He continues, “In addition, the profits of the airlines have doubled in the last few years since they began this practice, and these additional profits are clearly a social burden.”

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Think-Pair-Share

A Consumer Advocate is Discussing the Airline Industry

...We need legislation that requires airlines to charge all passengers on an airplane the same price for their travel.”

- A. List some of the ways airlines divide their customers according to their willingness to pay.
- B. Is it necessarily inefficient for airlines to charge different prices to different customers? Why or why not?
- C. Is the increase in profits generated by this type of price discrimination a social cost? Explain.

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Chapter In A Nutshell

- ▶ Monopoly: the sole seller in its market.
- ▶ Monopoly arises when:
 - ▶ A single firm owns a key resource
 - ▶ The government gives a firm the exclusive right to produce a good
 - ▶ A single firm can supply the entire market at a lower cost than many firms could.
- ▶ Monopoly faces a downward-sloping demand curve for its product: $MR < P$

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Chapter In A Nutshell

- ▶ Monopoly maximizes profit
 - ▶ Produce Q where $MR = MC$, but Q is not efficient
 - ▶ For this Q , the price is on the demand curve.
 - ▶ So $P > MR = MC$
 - ▶ Causes deadweight loss
- ▶ **Price Discrimination**: charge different prices for the same good based on a buyer's willingness to pay.
 - ▶ Can raise economic welfare by getting the good to some consumers who would otherwise not buy it.

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Chapter In A Nutshell

- ▶ **Perfect Price Discrimination**
 - ▶ No deadweight loss
 - ▶ Entire surplus goes to the monopoly producer
- ▶ Policymakers can:
 - ▶ Use antitrust laws to try to make the industry more competitive
 - ▶ Regulate the prices that the monopoly charges
 - ▶ Turn the monopolist into a government-run enterprise
 - ▶ Do nothing at all
 - ▶ **Or, just auction off the market (Demsetz, 1968)**

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Chapter 15: Monopoly

- ▶ **MR = MC** to maximize profit (still true!)
- ▶ But, **P > MR** (**D** - downward sloping)
- ▶ Welfare Cost of a Monopoly:
 - ▶ Profits (unfair?) vs. DWL (efficiency loss!)
- ▶ Cures? Do nothing?
 - ▶ Auction off the market!
- ▶ Homework: Mankiw, Ch.15, Problem 5-11

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Challenge Questions (Past Finals)

- ▶ 2007 - Part 1
- ▶ 2008 - Essay D
- ▶ 2009 - Essay A
- ▶ 2018 - Essay B4-B5
- ▶ 2019 - Essay B9-B10
- ▶ **True or False.** Monopolists can achieve any level of profit they desire because they have unlimited market power.
- ▶ **True or False.** Heavy competition among firms for a limited number of customers leads to such devices as discounts for students and senior citizens.

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