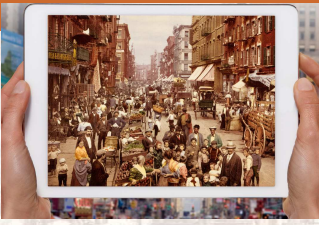


N. GREGORY MANKIWI

PRINCIPLES OF  
**ECONOMICS**  
Eight Edition



CHAPTER  
**15**

**Monopoly**

Premium PowerPoint Slides by:  
V. Andreea CHIRITESCU  
Eastern Illinois University

Modified by Joseph Tao-yi Wang

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

Look for the answers to these questions:

- 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?

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

**Introduction**

- **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
    - A competitive firm has no market power
  - Arise due to barriers to entry
    - Other firms cannot enter the market to compete with it

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

**Three Barriers to Entry**

1. **Monopoly resources**
  - A single firm owns a key resource.
    - E.g., 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.
    - E.g., patents, copyright laws, rice wine

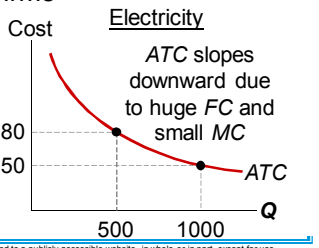
© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

**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

**Example: 1000 homes need electricity.**

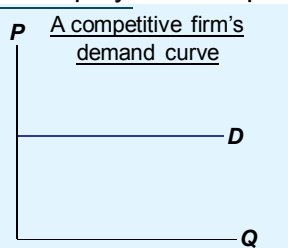
ATC is lower if one firm services all 1000 homes than if two firms each service 500 homes.



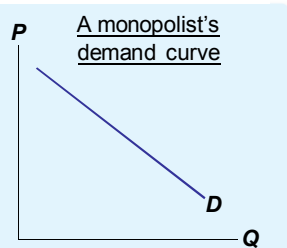
© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

**Monopoly vs. Competition: Demand Curves**

**A competitive firm's demand curve**



**A monopolist's demand curve**



In a competitive market, the market demand curve slopes downward. But the demand curve for any individual firm's product is horizontal at the market price. The firm can increase  $Q$  without lowering  $P$ , so  $MR = P$  for the competitive firm. A monopolist is the only seller, so it faces the market demand curve. To sell a larger  $Q$ , the firm must reduce  $P$ . Thus,  $MR \neq P$ .

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

### Active Learning 1 A monopoly's revenue

Hello Café (桌遊去) is the only seller of cappuccinos in NTU. The table shows the market demand for cappuccinos. 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	\$180		n.a.	
1	160			
2	140			
3	120			
4	100			
5	80			
6	60			

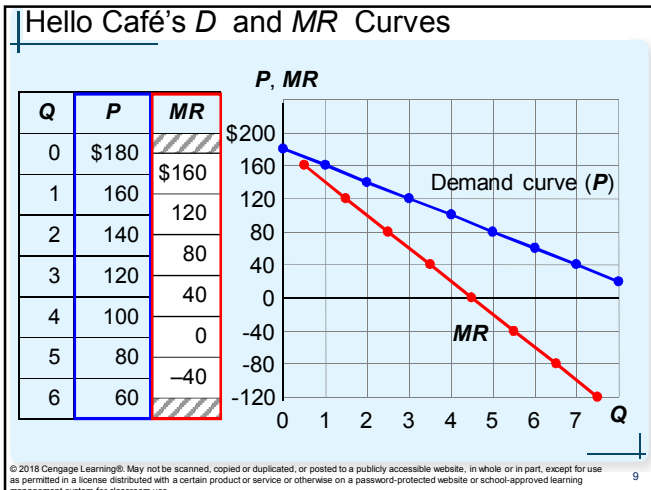
© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

### Active Learning 1 Answers

- $P = AR$ , same as for a competitive firm.
- $MR < P$ , whereas  $MR = P$  for a competitive firm.

Q	P	TR	AR	MR
0	\$180	\$ 0	n.a.	
1	160	160	\$160	\$160
2	140	280	140	120
3	120	360	120	80
4	100	400	100	40
5	80	400	80	0
6	60	360	60	-40

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.



### Understanding the Monopolist's MR

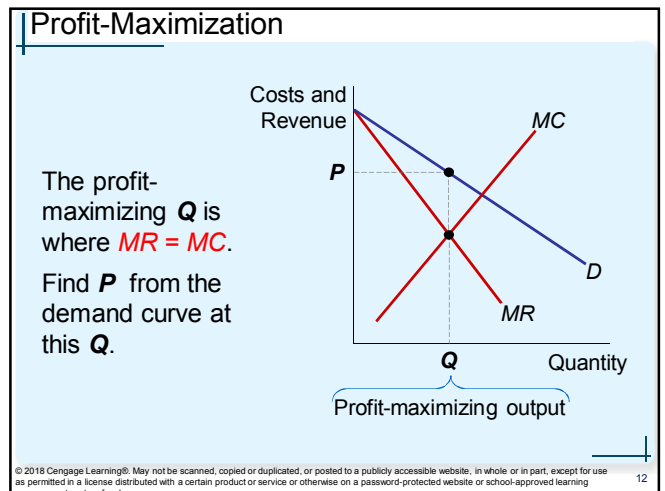
- Increasing  $Q$  has two effects on revenue:
  - Output effect: higher output raises revenue
  - Price effect: lower price reduces revenue
- Marginal revenue,  $MR < P$ 
  - To sell a larger  $Q$ , the monopolist must reduce the price on all the units it sells
  - Is negative if price effect > output effect
    - e.g., when Hello Café increases  $Q$  from 5 to 6

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

### Profit-Maximization

- Like a competitive firm, a monopolist maximizes profit by producing the quantity where  $MR = MC$ 
  - Sets the highest price consumers are willing to pay for that quantity
  - It finds this price from the  $D$  curve

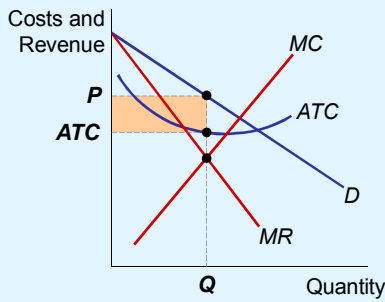
© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.



### The Monopolist's Profit

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

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



© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use. 13

### A Monopoly Does Not Have an S Curve

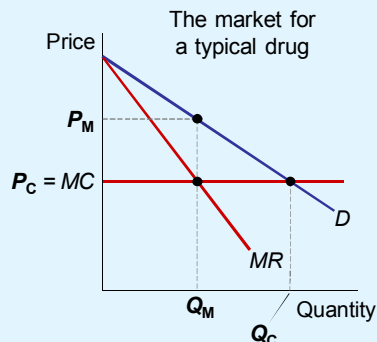
- A competitive firm takes P as given
  - Has a supply curve that shows how its Q depends on P
- A monopoly firm is a “price-maker”
  - Q does not depend on P
  - Q and P are jointly determined by MC, MR, and the demand curve
  - Hence, no supply curve for monopoly.

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use. 14

### CASE STUDY: Monopoly vs. Generic Drugs

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

When the patent expires, the market becomes competitive, generics appear.



© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use. 15

### The Welfare Cost of Monopoly

- Recall:
  - Competitive market equilibrium:  $P = MC$  and total surplus is maximized
- Monopoly equilibrium,  $P > MR = MC$ 
  - 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use. 16

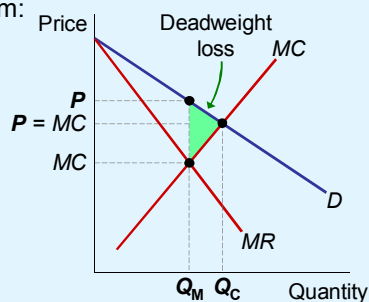
### The Welfare Cost of Monopoly

Competitive equilibrium:

- quantity =  $Q_C$
- $P = MC$
- total surplus is maximized

Monopoly equilibrium:

- quantity =  $Q_M$
- $P > MC$
- deadweight loss



© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use. 17

### 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use. 18

## 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Single Price Monopoly

Here, the monopolist charges the same price ( $P_M$ ) to all buyers.

A deadweight loss results.

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Perfect Price Discrimination vs. Single Price Monopoly

Here, the monopolist produces the competitive quantity, but charges each buyer his or her WTP.

This is called **perfect price discrimination**.

The monopolist captures all CS as profit. But there's no DWL.

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Price Discrimination in the Real World

- **Perfect price discrimination**
  - Not possible in the real world
    - 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Examples of Price Discrimination

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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Examples of Price Discrimination

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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Examples of Price Discrimination

- **Quantity discounts**
  - A buyer's WTP often declines with additional units, so firms charge less per unit for large quantities than small ones.
    - Example: A movie theater charges NT\$160 for a small popcorn and NT\$200 for a large one that's twice as big

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## ASK THE EXPERTS

### Airline Mergers

*"If regulators had not approved mergers in the past decade between major networked airlines, travelers would be better off today."*

What do economists say?

Response	Percentage
Disagree	26%
Agree	29%
Uncertain	45%

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Public Policy Toward Monopolies

- 2. Regulation**
  - Regulate the behavior of monopolists
    - 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## 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 no profit motive to minimize costs

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Public Policy Toward Monopolies

- 4. Do nothing**
  - Some economists argue that it is often best for the gov't not to try to remedy the inefficiencies of monopoly pricing
    - Determining the proper role of the gov't 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## 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

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Summary

- A monopoly is a firm that is the sole seller in its market.
  - A monopoly arises when a single firm owns a key resource, when the government gives a firm the exclusive right to produce a good, or when a single firm can supply the entire market at a lower cost than many firms could.
  - Faces a downward-sloping demand curve for its product.

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Summary

- Monopoly increases production by 1 unit
  - Causes the price of its good to fall, which reduces the amount of revenue earned on all units produced.
  - Marginal revenue is always below the price
- A monopoly firm maximizes profit by producing the quantity at which marginal revenue equals marginal cost.
  - Sets the price at which that quantity is demanded.  $P > MR$ , so  $P > MC$

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Summary

- A monopolist's profit-maximizing level of output is below the level that maximizes the sum of consumer and producer surplus.
  - Causes deadweight losses
- A monopolist can often increase profits by charging different prices for the same good based on a buyer's willingness to pay.
  - Price discrimination can raise economic welfare
  - Perfect price discrimination, the deadweight loss of monopoly is completely eliminated

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## Summary

- Policymakers can respond to the inefficiency of monopoly behavior in four ways
  - 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
  - Can do nothing at all
- Or, just auction off the market. (Demsetz, 1968)

© 2018 Cengage Learning®. May not be scanned, copied or duplicated, or posted to a publicly accessible website, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website or school-approved learning management system for classroom use.

## 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

2017/11/25 Monopoly Joseph Tao-yi Wang

## Chapter 15: Monopoly

- ▶ Challenge Questions (Past Finals)
  - ▶ 2007 - Part 1                      2008 - Essay D
  - ▶ 2009 - Essay A                    2012 - Part III
- ▶ **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.

2017/11/25

Monopoly

Joseph Tao-yi Wang