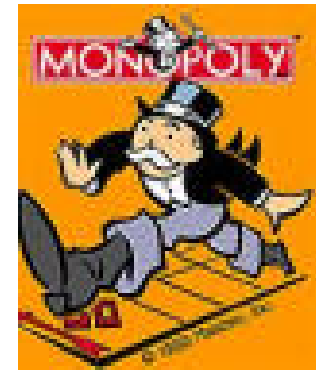


# Lectures 15 and 16

## *Monopoly*

# Key issues



1. monopoly profit maximization:  $MR = MC$
2. market power
3. monopoly welfare effects:  $p > MC \Rightarrow DWL$
4. cost advantages that create monopolies
5. government actions that create monopolies
6. government actions that reduce market power
7. dominant firm and competitive fringe

# Monopoly

- *monopoly*: *only* supplier of a good for which there is no close substitute
- monopoly's output is the market output:  $q = Q$
- monopoly's demand curve is market demand curve
  - its demand curve is downward sloping
  - it doesn't lose all its sales if it raises its price
- it is a price setter



# Profit maximization

# Marginal revenue

- firm's *MR* curve depends on its demand curve
- monopoly's *MR* curve
  - lies below its demand curve at any positive quantity
  - because its demand curve is downward sloping
- demand curve shows price,  $p$ , it receives for selling a given quantity,  $Q$
- price =  $p$  = average revenue

Marginal revenue,  $MR$

# Average and Marginal Revenue



# Average and Marginal Revenue



# Deriving monopoly's *MR* curve

Linear *MR* curve

In our example

# *MR* and elasticity of demand

- *MR* at any given quantity depends on
  - demand curve's height (price)
  - demand curve's shape (elasticity)
- thus, it depends on its elasticity

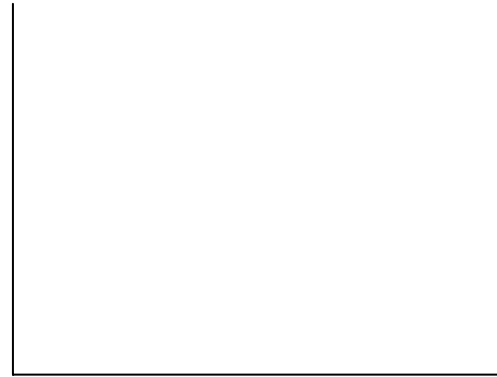
*MR* and price

# Choosing price or quantity

- monopoly can set  $p$  or  $Q$  to maximize its profit,  $\pi$
- monopoly is constrained by market demand curve
  - it cannot set both  $Q$  and  $p$  (cannot pick a point above demand curve)
  - if monopoly sets  $p$ , demand curve determines  $Q$
  - if monopoly sets  $Q$ , demand curve determines  $p$
- because monopoly wants to maximize  $\pi$ , it chooses same profit-maximizing solution whether it sets  $p$  or  $Q$

# Profit maximization

# Maximizing Profit

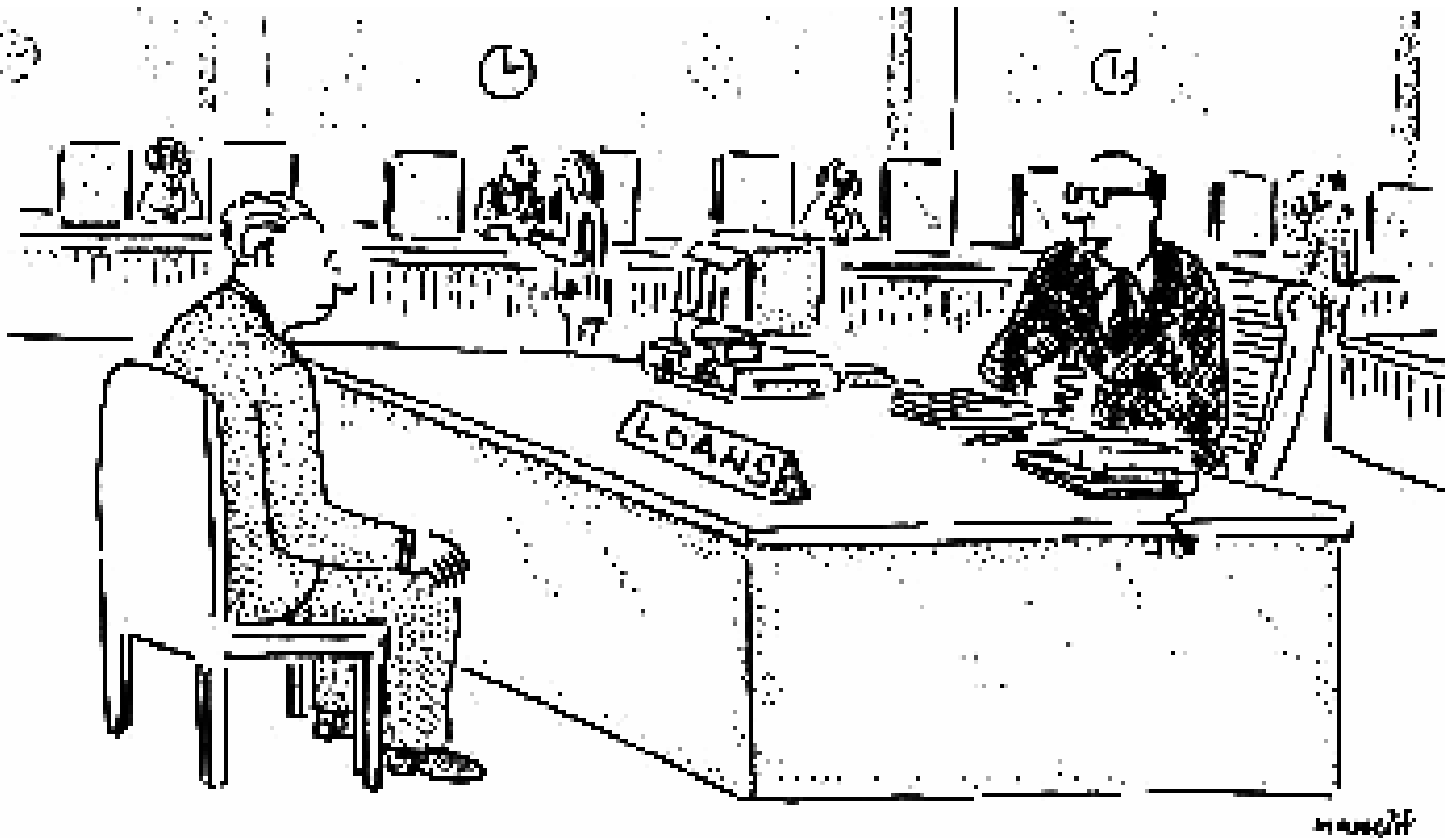


# Monopoly optimum

- firm operates where  $MR = MC$
- because  $MC$  is nonnegative, a monopoly never operates in the inelastic portion of the demand curve

# Market power

ability of a firm to charge a price above  
marginal cost profitably



*“Of course, you could try another bank if there were any other banks.”*

Hand over \$25 in service charges  
and no funny stuff.



Walt Disney

© 1958 Disney Studios

7-17

www.disney.com

# Market power and shape of demand curve

Lerner index (price markup)



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# Causes of market power

monopoly's demand curve is relatively inelastic if

- consumers are willing to pay "virtually anything" for it
- no close substitutes for firm's product exist
- other firms can't enter market
- other similar firms are located far away
- other firms' products very different

# Welfare effects of monopoly

# Deadweight Loss of Monopoly



# Why monopolies?

- firm has cost advantage over others firms
- government created monopoly
- merger of several firms into a single firm
- firms act collectively: cartel
- strategies - such as threats of violence - that discourage other firms from entering market

# Sources of cost advantages

- firm controls a key input:
- *essential facility*: scarce resource that rival needs to use to survive
  - firm knows of superior technology, or
  - has better way of organizing production

# Natural monopoly

# Sufficient condition

natural monopoly if

- $AC$  curve falls at any observed quantity for all firms
- economies of scale

# Electricity example



# Natural Monopoly



# Costs of producing $Q = 12$

<i># of firms</i>	<i>output</i>	$AC = 10 + 60/Q$	$C$
1	12	\$15	\$180
2	6	\$20	\$240

having only one firm produce avoids a second fixed cost ( $MC$  doesn't vary with number of firms)

# Public utilities

apparently believing they're natural monopolies, governments grant monopoly rights for essential good or service “public utilities”

- water
- gas
- electric power
- mail delivery

# Electric power utilities

- *AC* curve for U.S electric-power-producing firms in 1970
  - was U-shaped
  - reached its minimum at 33 billion kWh per year
- whether an electric power utility is a natural monopoly depends on demand it faces

# Economies of scale

- natural monopolies: most electric companies operated in regions of substantial economies of scale
  - Newport Electric produced 0.5 billion kWh/year
  - Iowa Southern Utilities: 1.3 billion kWh/year
- not natural monopolies: a few operated in upward-sloping section of  $AC$  curve
  - Southern produced 54 kWh/year
  - 2 firms could produce that quantity at 3¢ less per thousand kWh than could a single firm

# Application Electric Power Utilities



# Government created monopolies

- barriers to entry (e.g, patents)
- own and manage many monopolies
  - postal services
  - garbage collection
  - utilities
    - electricity
    - water
    - gas
    - phone services



# Barriers to entry

governments prevent other firms from entering a market in 3 ways

- by making it difficult for new firms to obtain a license to operate
- by granting a firm rights to be a monopoly
- by auctioning rights to be a monopoly

# Granting rights

- the United States, granted exclusive (monopoly) rights to portions of the electromagnetic spectrum (TV)
- thereby gave broadcast television stations at least \$40 billion in present value terms for the first 30 years of television

# Patents

- grants an inventor right to be monopoly provider of good for a number of years
- stimulates research

# Justification

- patent monopoly profits spur new research
- people benefit greatly from many inventions  
(new drugs)

# Monopoly optimum



THIS MERGER-MANIA  
IS GETTING OUT  
OF HAND.



MICROSOFT  
STARBUCKS  
CITIGROUP

ONE LOW-RISK,  
LOW-FAT, NO-LOAD  
CAPPUCCINO, PLEASE.

FREE POCKET-T  
WITH EVERY NEW  
CHECKING ACCOUNT!

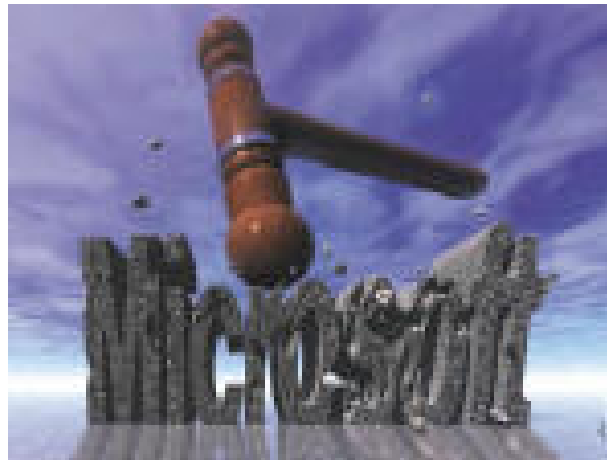
WOULD YOU LIKE  
FRIES WITH THAT  
BROWSER?

# Mergers

- if all firms in a market merge (and no new ones enter), then a monopoly is formed
- US Dept. of Justice and FTC challenge such mergers
- (see Chapter 13)

# Government actions that reduce market power

- antitrust laws prohibit monopolization, price fixing, and so forth
- regulations prevent monopolies from exercising all of their market power



DANG, I STILL  
CAN'T GET  
PAST LEVEL  
ONE.

REASON 97  
JK



SHOULD WE TELL  
HIM THIS VERSION  
IS OUTDATED?

U.S.  
JUSTICE  
DEPT.

ZAP  
BILL  
GATES

# Optimal price regulation

- price regulation may eliminate *DWL*
- regulation is optimal if it leads to "competitive" outcome

# Optimal Price Regulation



# Nonoptimal price regulation

- welfare is reduced if government does not set price optimally
- if regulated  $p$  is  $<$  minimum of monopoly's  $AVC$ , monopoly shuts down
- if regulated price is between shut-down point and monopoly price but not equal to competitive price
  - too little is produced
  - welfare is below competitive level

# Regulating an Electric Utility



# Sharing textbook revenues

- college-textbook publishers usually pay authors a *royalty*: fraction of wholesale revenues
- why pay a percentage of revenues rather than
  - lump-sum payment
  - percentage of profit?

# Explanations

- neither authors nor publishers can accurately forecast sales, hence agreeing on a lump-sum payment is difficult
- authors don't want a percentage of profit because they don't trust publishers to accurately report profit

# Maximizing joint profit

Which royalty method(s) maximizes *joint profit*: sum of publisher's and author's profit?

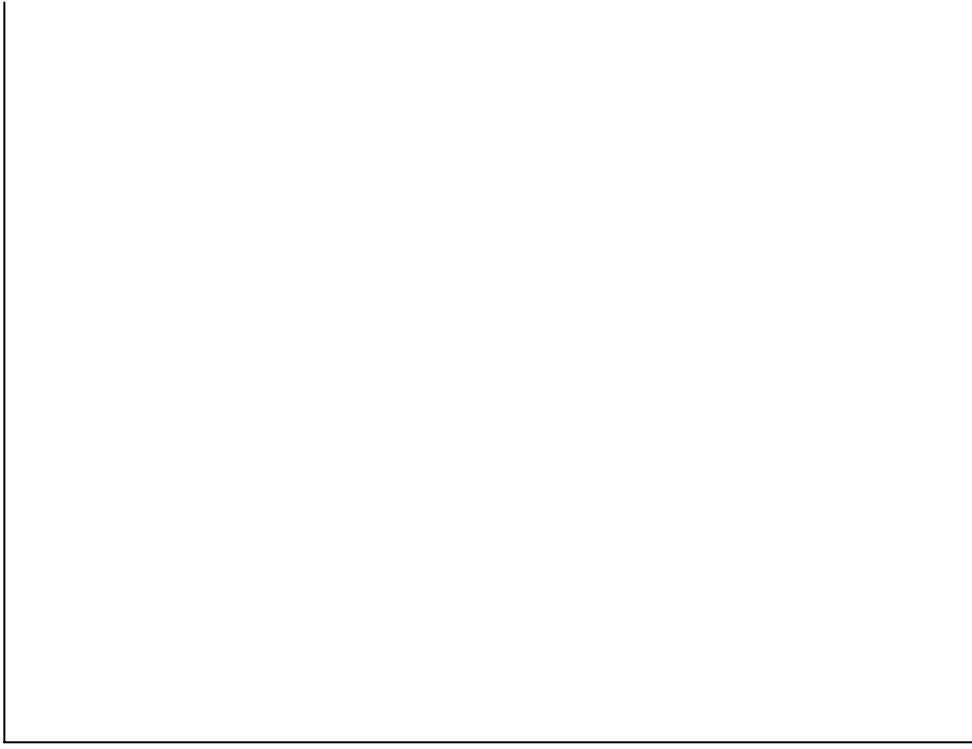
Author's royalty is a

- A. fraction of revenue
- B. fraction of economic profit
- C. lump-sum payment

# Problem with revenue sharing

- leads to inefficiency: too few books are sold
- no inefficiency with
  - lump-sum fee
  - percentage of profit

Lump-sum fee



# Percentage of joint profit

- if used, publisher would set price to maximize joint profit,  $\pi$ , which maximizes both parties' shares
- however, authors do not trust publishers to truthfully report economic profit
  - even without falsifying its accounts, publisher can report very low profit
  - because many costs of publishing are shared across textbooks (joint product)
- authors put more trust in reported revenue

# Model

- demand for textbook is downward sloping
  - so there is some market power
  - rival texts limit the market power
- constant marginal cost



# Dominant firm/competitive fringe

- *dominant firm* (DF): a price-setting firm that competes with price-taking firms (*competitive fringe*)
- DF maximizes its profit given
  - its cost curves and
  - demand curve it faces
  - (before fringe enters, DF faces market demand)

# Residual demand curve

after entry, DF faces *residual demand curve*:  
the market demand that is not met by other  
firms (competitive fringe) at any given price:

$$D^r(p) = D(p) - S^f(p)$$

where  $S^f$  is fringe's supply curve

# Residual demand curve

# Dominant Firm-Competitive Fringe Equilibrium



# 1. Monopoly profit maximization

## 2. Market power

- ability of a firm to charge a price above  $MC$  and earn a positive profit
- more elastic is demand at  $Q$  where monopoly maximizes its profit
  - closer is its  $p$  to its  $MC$
  - closer is Lerner Index,  $(p - MC)/p$ , to zero (competitive level)

### 3. Welfare effects of monopoly

- because a monopoly's  $p > MC$
- too little output is produced
- society suffers a *DWL*
- consumers are worse off
- monopoly's profit  $>$  competitive level

## 4. Cost advantages that create monopolies

firm may become a monopoly if it

- controls a key input
- has superior knowledge about producing or distributing a good
- has substantial economies of scale
- in markets with substantial economies of scale, single seller is a natural monopoly

# 5. Government actions that create monopolies

- governments may establish
- government-owned and operated monopolies
- private monopolies by
- establishing barriers to entry
- patents

## 6. Government actions that reduce market power

- government can eliminate welfare harm of a monopoly by forcing firm to set its price at competitive level
- government can eliminate or reduce harms of monopoly by allowing or facilitating entry

# Elasticity of Demand and Total, Average, and Marginal Revenue

