Micro

McEachern ECON 2010-2011

CHAPTER 9

Monopoly

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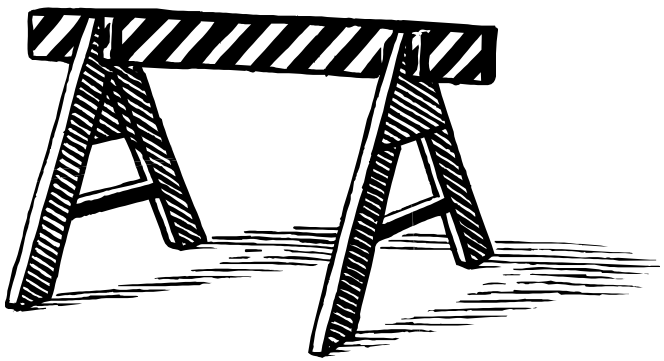
Barriers to Entry

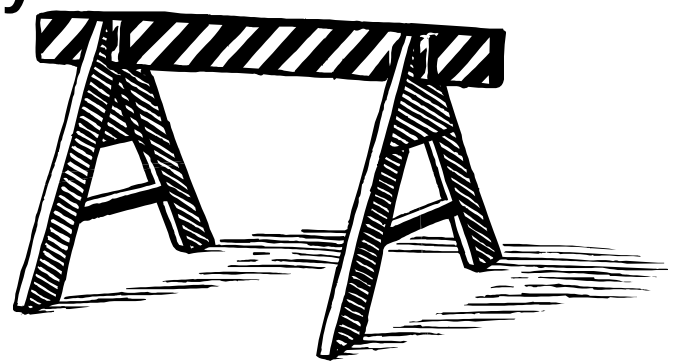
- **Monopoly**
  - **Sole supplier of a product with no close substitutes**
- **Barriers to entry**
  1. **Legal restrictions**
  2. **Economies of scale**
  3. **Control of essential resources**



LO1

Barriers to Entry

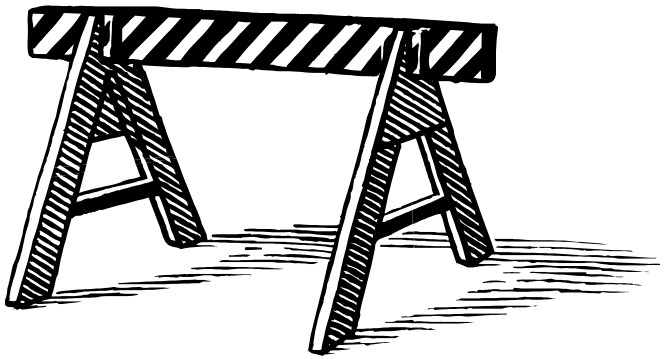
1. Legal restrictions
   - Patents and invention incentives
     - Patent – exclusive right for 20 years
   - Licenses and other entry restrictions
     - Federal license
     - State license



LO1

Barriers to Entry

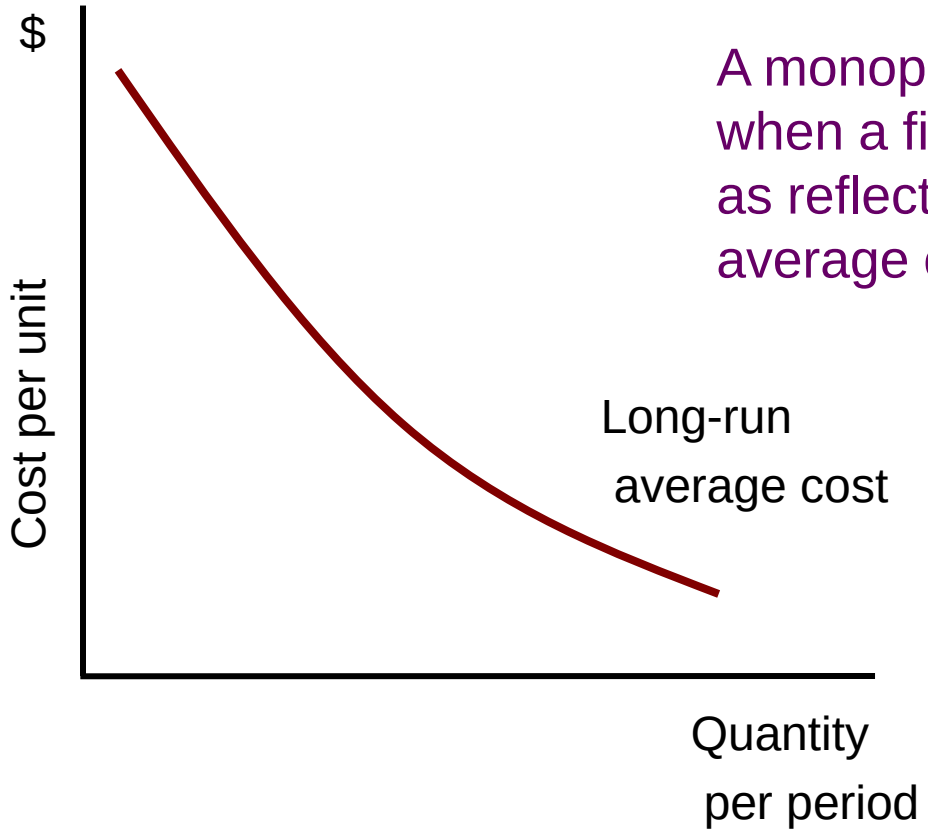
2. **Economies of scale**
   - **Natural monopoly**
   - **Downward-sloping LRAC curve**
     - **One firm can supply market demand at a lower ATC per unit than could two firms**



LO1

Exhibit 1

Economies of Scale as a Barrier to Entry

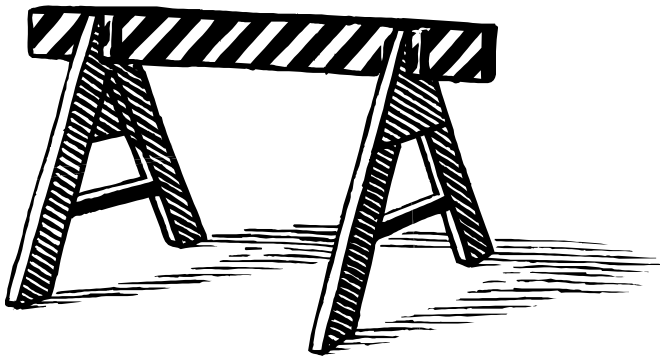


A monopoly sometimes emerges naturally when a firm experiences economies of scale as reflected by a downward-sloping long-run average cost curve.

One firm can satisfy market demand at a lower average cost per unit than could two or more firms, each operating at smaller rates of output.

Barriers to Entry

3. Control of essential resources
   - Alcoa (aluminum)
   - Professional sports leagues
   - China (pandas)
   - DeBeers Consolidated Mines (diamonds)



LO1

LO1

Is a Diamond Forever?

Case Study

- 1866, DeBeers
- Great Depression – lower diamond prices
  - DeBeers: control the world supply of uncut diamonds
- To increase consumer demand
  - Marketing "A diamond is forever"
    - Lasts forever, so should love
    - Remain in the family
    - Retain their value

LO1

Is a Diamond Forever?

Case Study

- Limit the supply of rough diamonds
  - Buyers: wholesalers
    - Box of uncut diamonds at a set price
      - No negotiations
- Violates U.S. antitrust laws
- Mid 1990s: lose control of some rough diamond supplies
  - Russia
  - Australia (Argyle)
  - Canada (Yellowknife)

LO1

Is a Diamond Forever?

Case Study

- Mid 1980s: 90% of market
- 2007: 45% of market
- Synthetic diamonds
- 2006: settle lawsuits ($300 million)
  - Comply with U.S. antitrust laws
  - Americans
    - 5% of world population
    - 50% of world's retail purchases
- 'Blood diamonds'; 'Conflict diamonds'

Monopoly

- Monopoly
  - Local
  - National
  - International
- Long-lasting monopolies
  - Rare
  - Economic profit attracts competitors
  - Technological change

LO2

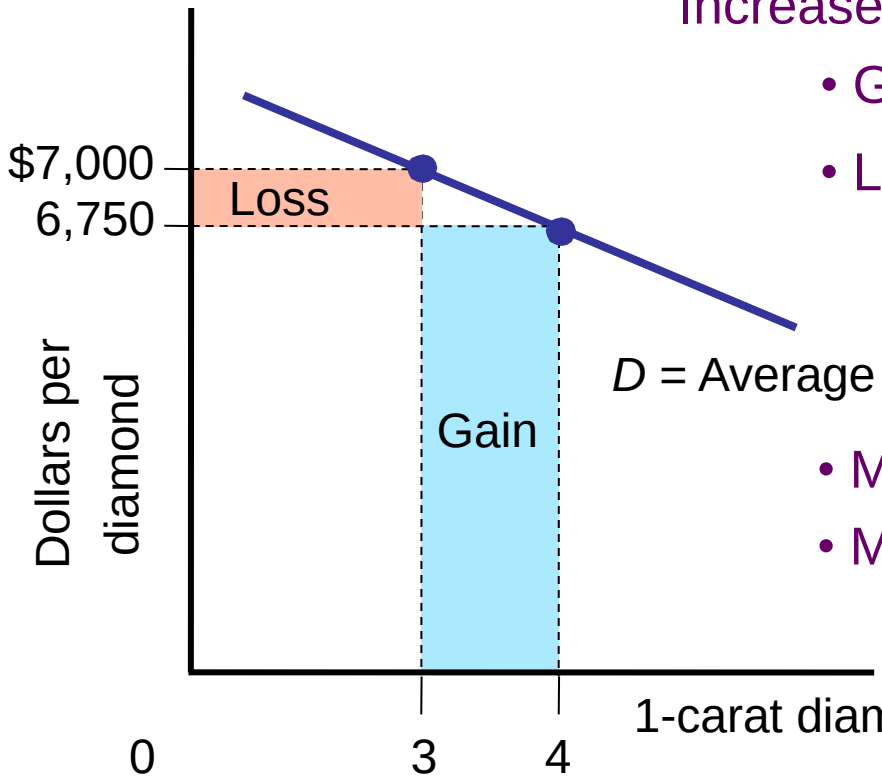
Revenue for the Monopolist

- Monopoly
  - Supplies the market demand
    - Downward-slopping D (law of D)
    - To sell more: must lower P on all units sold
- Total revenue TR=p*Q
- Average revenue AR=TR/Q
  - For monopolist: p=AR
- Demand D: also AR curve

LO2

Exhibit 2

A Monopolist's Gain and Loss in Total Revenue from Selling One More Unit



Increase quantity supplied from 3 to 4 diamonds:

- Gain in revenue: $6,750
- Loss in revenue: $750
  - selling the first three diamonds for $6,750 each instead of $7,000 each

- MR = gain – loss = $6,750-$750 = $6,000
- MR ($6,000)<*P*($6,750)

Revenue for the Monopolist

- Marginal revenue MR=ΔTR/ΔQ
  - For monopolist: MR<p
  - Declines, can be negative
- MR curve
  - Downward sloping
  - Below D=AR curve
- TR curve
  - Reaches maximum where MR=0

LO2

LO²

Revenue for DeBeers, a Monopolist

Exhibit 3

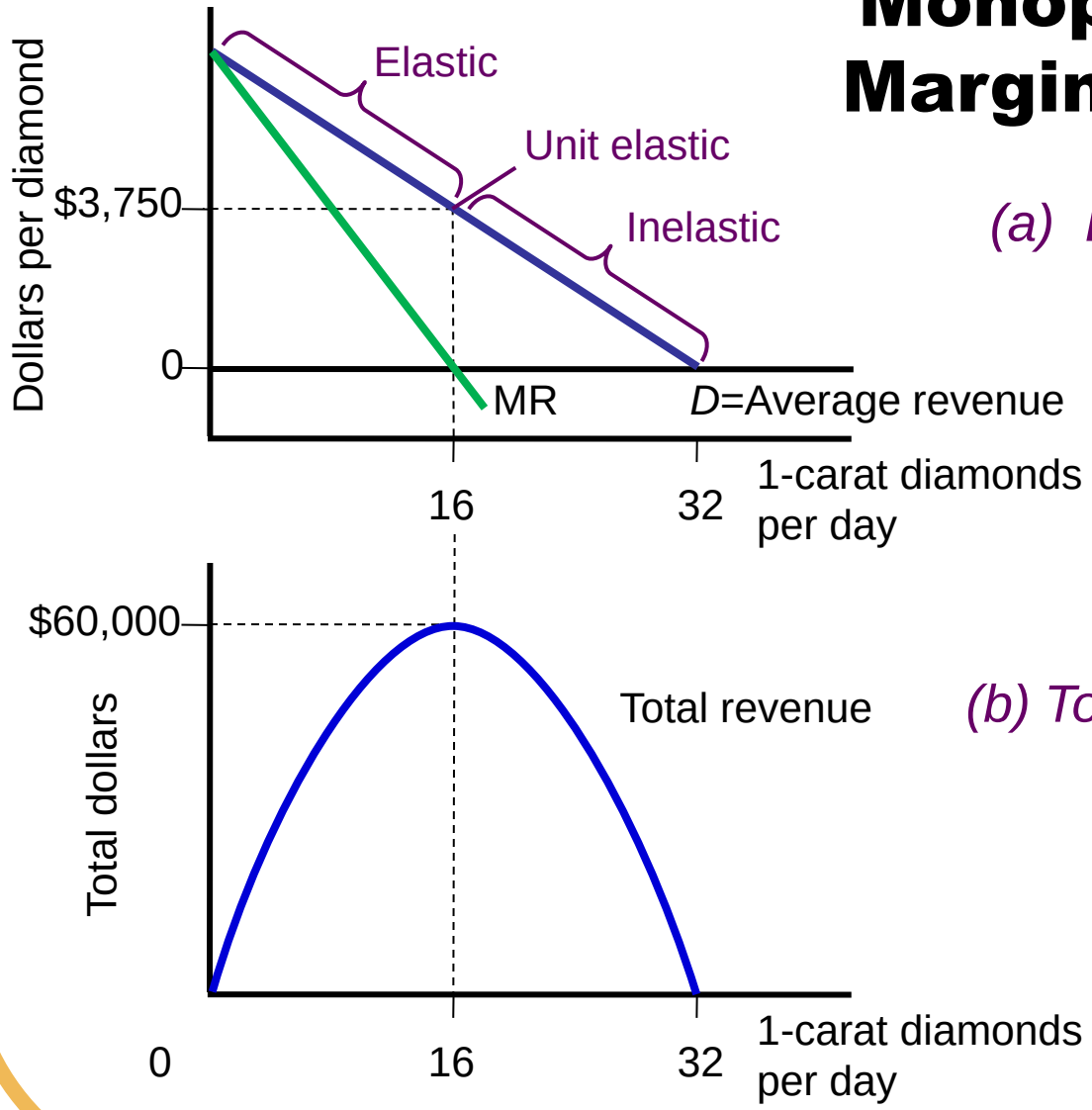
(1) 1-Carat Diamonds per day (Q)	(2) Price (average revenue) (p)	(3) Total Revenue ($TR = p \times Q$)	(4) Marginal Revenue ($MR = \Delta TR/\Delta Q$)
0	$7,750	0	—
1	7,500	$ 7,500	$7,500
2	7,250	14,500	7,000
3	7,000	21,000	6,500
4	6,750	27,000	6,000
5	6,500	32,500	5,500
6	6,250	37,500	5,000
7	6,000	42,000	4,500
8	5,750	46,000	4,000
9	5,500	49,500	3,500
10	5,250	52,500	3,000
11	5,000	55,000	2,500
12	4,750	57,000	2,000
13	4,500	58,500	1,500
14	4,250	59,500	1,000
15	4,000	60,000	500
16	3,750	60,000	0
17	3,500	59,500	–500

To sell more, the monopolist must lower the price on all units sold. Because the revenue lost from selling all units at a lower price must be subtracted from the revenue gained from selling another unit, MR is less than price. At some point, MR turns negative, as shown here when the price is reduced to $3,500.

LO2

Exhibit 4

Monopoly Demand and Marginal Total Revenue



(a) Demand and marginal revenue

D price elastic, as *p* falls

MR>0, TR increases

D price inelastic, as p falls

MR<0, TR decreases

(b) Total revenue

D unit elastic

MR=0, TR is maximum

Revenue for the Monopolist

- D curve: p=AR
- Where D elastic, as price falls
  - TR increases
  - MR>0
- Where D inelastic, as price falls
  - TR decreases
  - MR<0
- Where D unit elastic
  - TR is maximized; MR=0

LO^2

LO3

Firm's Costs and Profit Maximization

- Monopolist
  - Choose the price
  - OR the quantity
  - 'Price maker'
- Profit maximization
  - TR minus TC
    - Supply quantity where TR exceeds TC by the greatest amount
  - MR equals MC

LO3

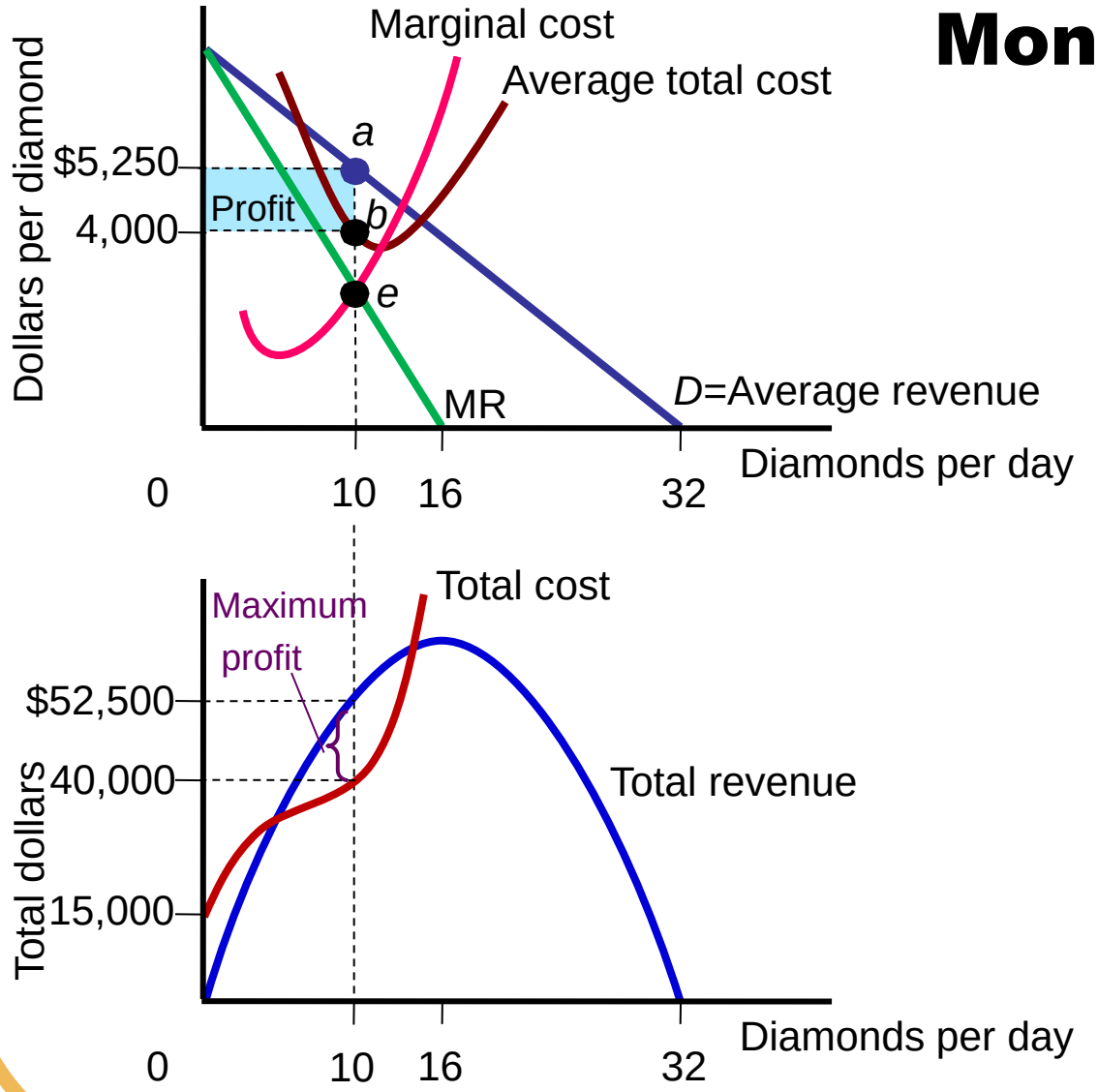
Exhibit 5

Short-run Costs and Revenue for a Monopolist

(1) Diamonds per Day (Q)	(2) Price (p)	(3) Total Revenue ($TR = p \times Q$)	(4) Marginal Revenue ($MR = \Delta TR/\Delta Q$)	(5) Total Cost (TC)	(6) Marginal Cost ($MC = \Delta TC/\Delta Q$)	(7) Average Total Cost ($ATC = TC/Q$)	(8) Total Profit or Loss ($= TR - TC$)
0	$7,750	0	—	$15,000	—	—	−$15,000
1	7,500	$7,500	$7,500	19,750	$4,750	$19,750	−12,250
2	7,250	14,500	7,000	23,500	3,750	11,750	−9,000
3	7,000	21,000	6,500	26,500	3,000	8,833	−5,500
4	6,750	27,000	6,000	29,000	2,500	7,250	−2,000
5	6,500	32,500	5,500	31,000	2,000	6,200	1,500
6	6,250	37,500	5,000	32,500	1,500	5,417	5,000
7	6,000	42,000	4,500	33,750	1,250	4,821	8,250
8	5,750	46,000	4,000	35,250	1,500	4,406	10,750
9	5,500	49,500	3,500	37,250	2,000	4,139	12,250
10	**5,250**	**52,500**	**3,000**	**40,000**	**2,750**	**4,000**	**12,500**
11	5,000	55,000	2,500	43,250	3,250	3,932	11,750
12	4,750	57,000	2,000	48,000	4,750	4,000	9,000
13	4,500	58,500	1,500	54,500	6,500	4,192	4,000
14	4,250	59,500	1,000	64,000	9,500	4,571	−4,500
15	4,000	60,000	500	77,500	13,500	5,167	−17,500
16	3,750	60,000	0	96,000	18,500	6,000	−36,000
17	3,500	59,500	−500	121,000	25,000	7,118	−61,500

LO3

Exhibit 6



Monopoly Costs and Revenue

A profit-maximizing monopolist supplies 10 diamonds per day and charges $5,250 per diamond.

Profit = $12,500
(profit per unit × *Q*)

Maximize profit where TR exceeds TC by the greatest amount: *Q*=10
Maximum profit =
TR-TC = $12,500

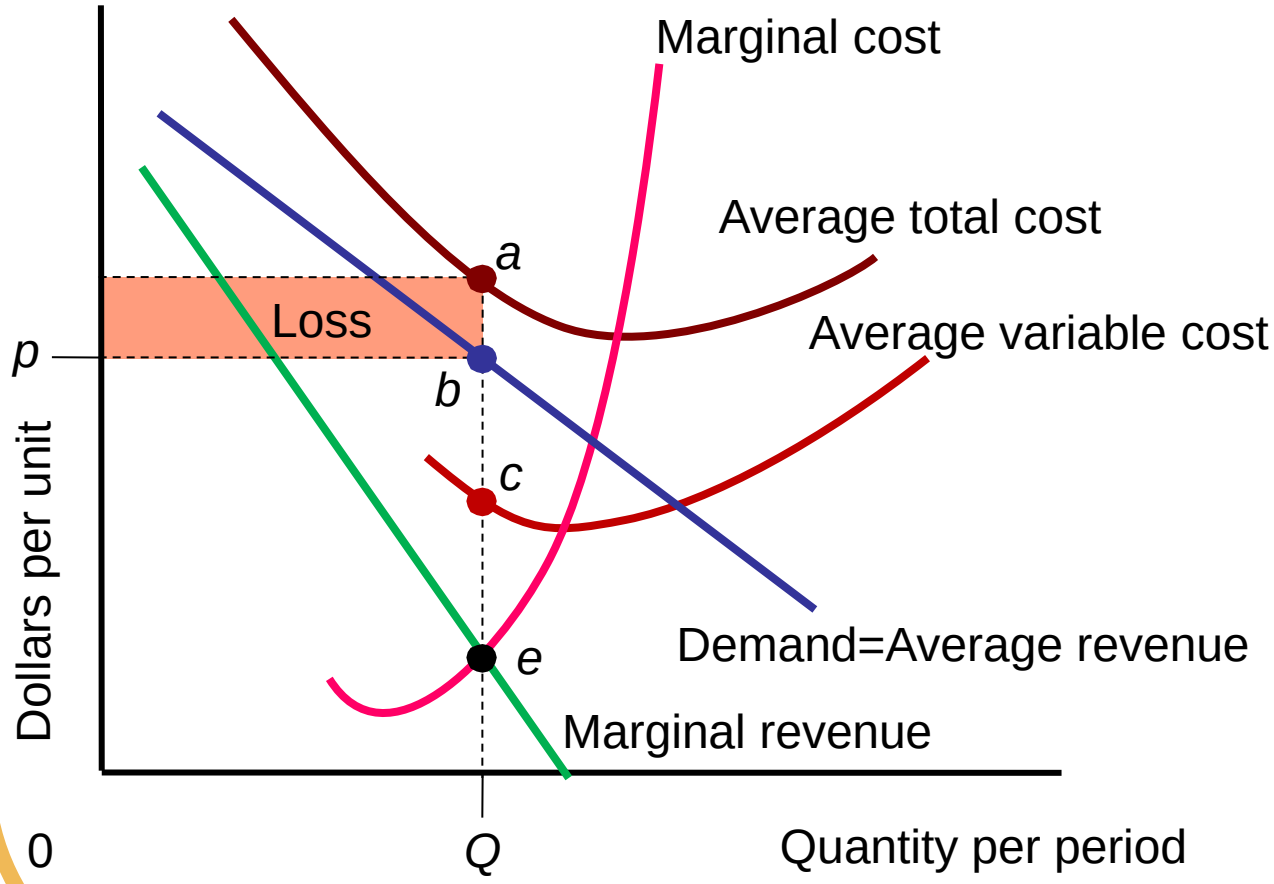
LO3

Short-Run Losses; Shutdown Decision

- If p>ATC
  - Economic profit
- If ATC>p>AVC
  - Economic loss
  - Produce in short run
- If p<AVC: AVC curve above D curve
  - Economic loss
  - Shut down in short run

Exhibit 7

The Monopolist Minimizes Losses in the Short Run



For *Q*, *ATC* is at point *a*

P<*ATC*, monopolist suffers a loss

For *Q*, price=*p* at point *b*, on *D* curve

MR=MC at point *e*: quantity *Q*

Monopolist continue to produce because *p*>*AVC* (*AVC* is at point *c*)

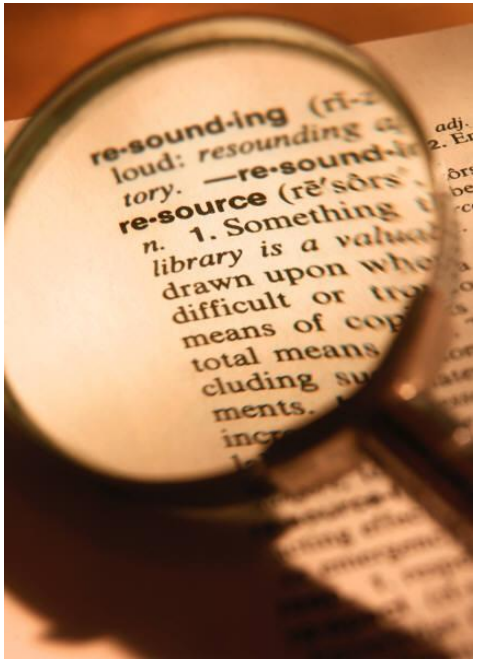
LO3

Long-Run Profit Maximization

- Short-run profit
  - No guarantee of long-run profit
- High barriers that block new entry
  - Economic profit
- Erase a loss or increase profit
  - Adjust the scale of the firm
- If unable to erase a loss
  - Leave the market

Monopoly and Allocation of Resources

- Perfect competition
  - Long run equilibrium
  - Constant-cost industry
  - Marginal benefit (p) = MC
  - Allocative efficient market
  - Max social welfare
  - Consumer surplus



LO4

Monopoly and Allocation of Resources

- Monopoly
  - Marginal benefit (p) > MC
  - Restrict Q below what would maximize social welfare
  - Smaller consumer surplus
  - Economic profit
  - Deadweight loss of monopoly

LO4

- Allocative inefficiency

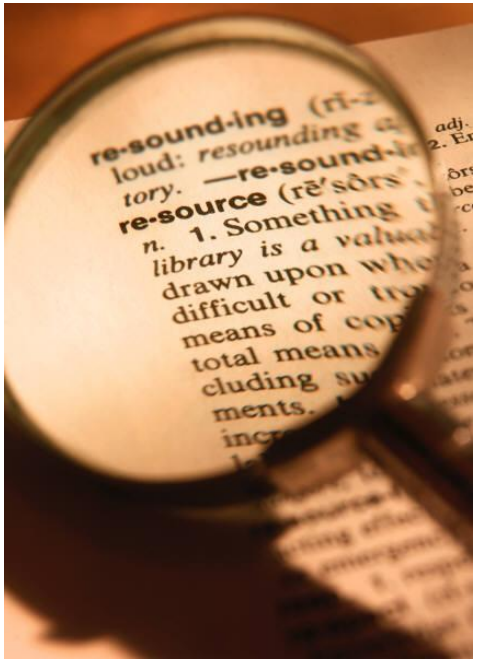
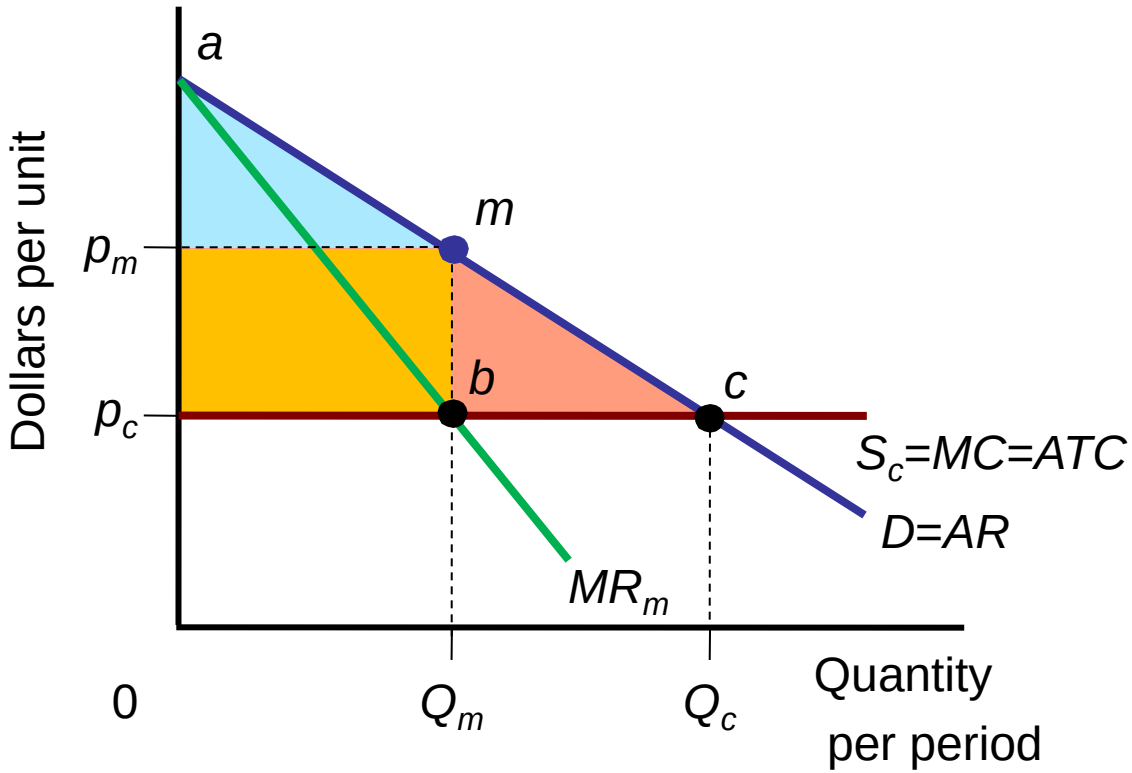


Exhibit 8

Perfect Competition and Monopoly



Monopoly

- Q_m where MR_m=MC (point b)
- p_m on D (point m)
- Consumer surplus: amp_m
- Economic profit: $p_m mbp_c$
- Deadweight loss: mbc

Perfect competitive industry

- Q_c and p_c where D intersects S_c (point c)
- Consumer surplus: acp_c

Monopoly

- higher price
- lower quantity

Problems Estimating Deadweight Loss

- Deadweight loss might be lower
  - Lower price and average cost
    - Substantial economies of scale
  - Price below the profit maximizing value
    - Public scrutiny, political pressure
    - Avoid attracting competition

LO5

Problems Estimating Deadweight Loss

- Deadweight loss might be higher
  - Secure and maintain monopoly position
    - Use resources; social waste
    - Influence public policy (Rent seeking)
  - Inefficiency
  - Slow to adopt new technology
  - Reluctant to develop new products
  - Lack innovation

LO5

LO5

The Mail Monopoly

Case Study

- 1775: U.S. Post Office – Monopoly
- 1971 U.S. Postal Service
  - Semi-independent
- $70 billion revenue in 2006;
- 46% of the world's total mail delivery
- Legal monopoly
  - First-class letters
  - Mailbox

LO5

The Mail Monopoly

Case Study

- First-class stamp
  - 9 cents in 1970
  - 42 cents in 2008
- Substitutes
  - Phone calls, e-mail, e-card, text message
  - On-line bill-payment, fax machine
  - Competition: UPS, FedEx, DHL

LO5

The Mail Monopoly

Case Study

- **New services**
  - **Confirmed delivery for eBay**
  - **Netflix (DVD rentals)**
  - **On-line purchasing (package delivery)**

Price Discrimination

- Charge different prices to different groups of consumers
- Conditions
  - Downward sloping D curve
  - At last two groups of consumers
    - Different price elasticity of demand
  - Ability to charge different prices
    - At low cost
  - Prevent reselling of the product

LO6

A Model of Price Discrimination

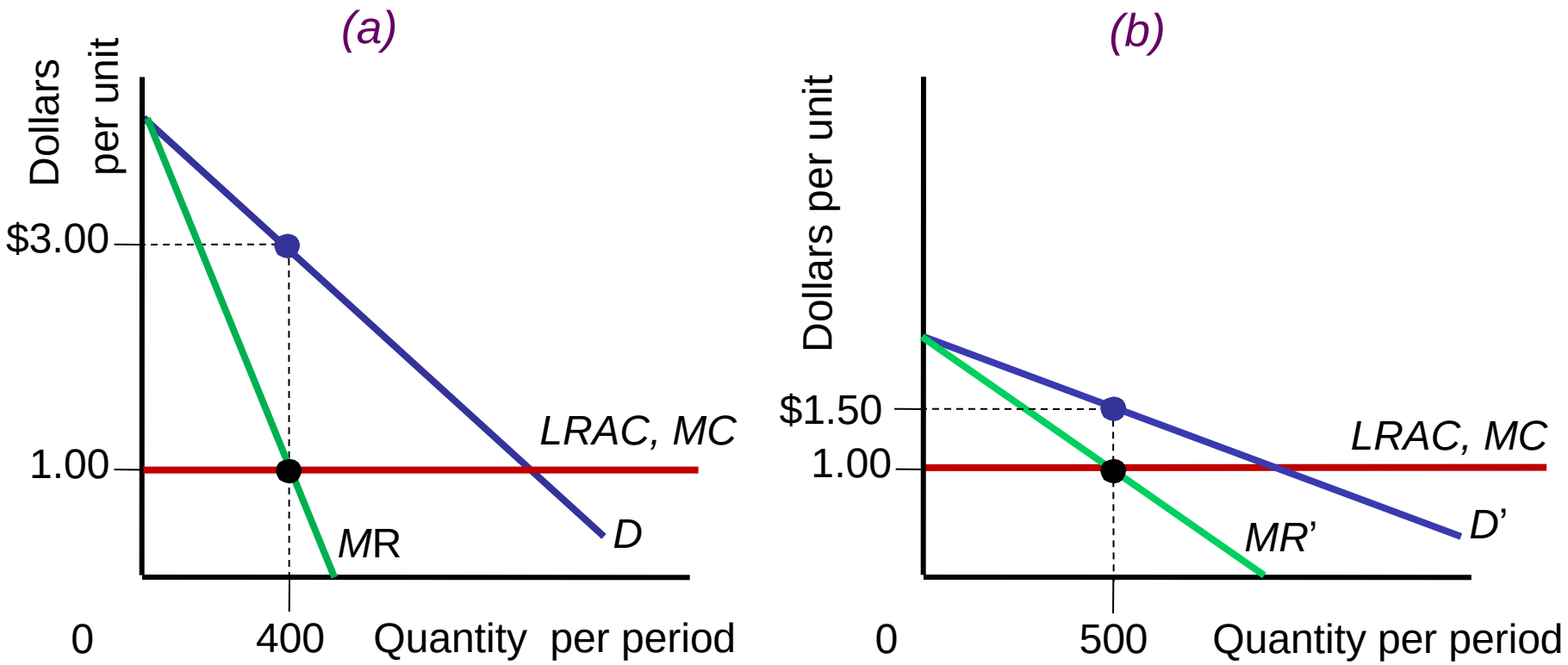
- Two groups of consumers
  - One group (A): less elastic D
  - The other (B): more elastic D
- Maximize profit
  - MR=MC in each market
  - Lower price for group (B)

LO6

LO6

Exhibit 9

Price Discrimination with Two Groups of Consumers



A monopolist facing two groups of consumers with different demand elasticities may be able to practice price discrimination to increase profit or reduce loss. With marginal cost the same in both markets, the firm charges a higher price to the group in panel (a), which has a less elastic demand than group in panel (b).

Examples of Price Discrimination

- Airline travel
  - Businesspeople (business class)
    - Less elastic D; Higher price
  - Same class, different prices
    - Discount fares; weekend stay
- IBM laser printer
  - 5 pages/minute: home; cheaper
  - 10 pages/minute: business; expensive
- Amusement parks
  - Out-of-towners: less elastic D

LO6

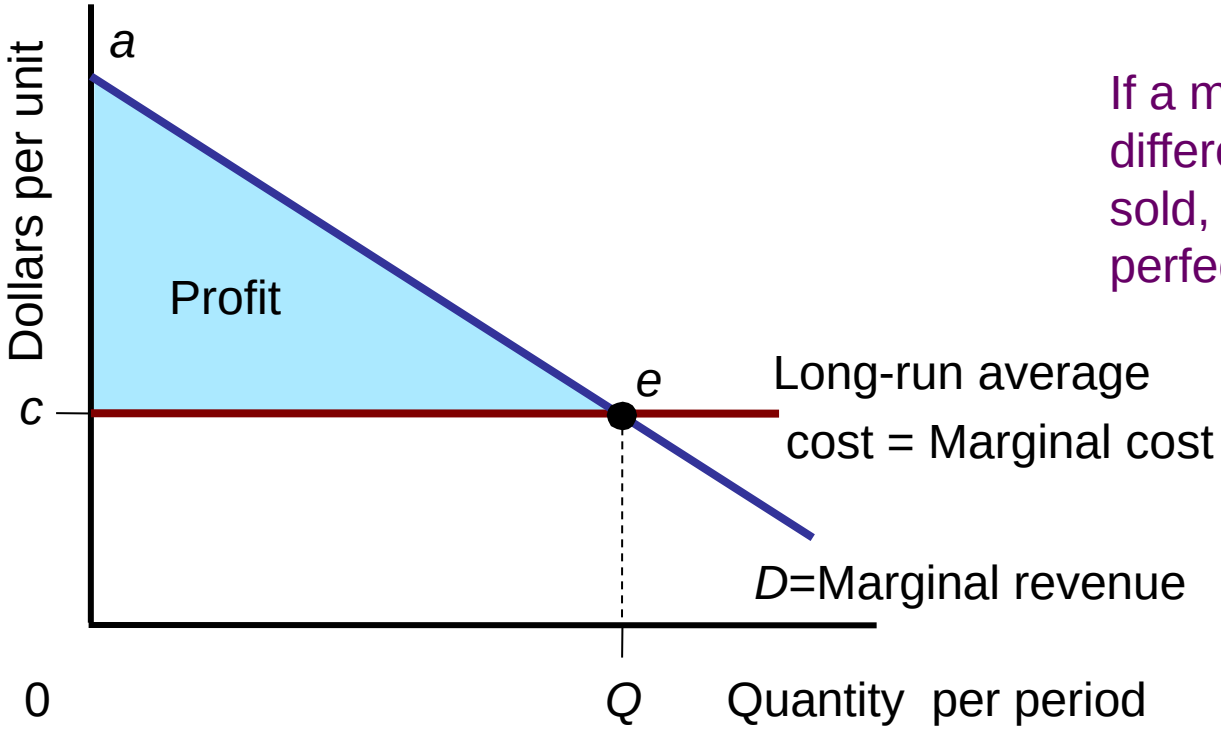
Perfect Price Discrimination

- The monopolist's dream
- Charge consumers what they are willing to pay
  - Charge different prices for each unit sold
    - D curve becomes MR curve
  - Convert consumer surplus into economic profit
    - Allocative efficiency
    - No deadweight loss

LO6

Exhibit 10

Perfect Price Discrimination



If a monopolist can charge a different price for each unit sold, it may be able to practice perfect price discrimination.

By setting the price of each unit equal to the maximum amount consumers are willing to pay for that unit (shown by the height of the demand curve), the monopolist can earn a profit equal to the area of the shaded triangle (*ace*).

Consumer surplus is zero. Ironically, this outcome is efficient because the monopolist has no incentive to restrict output, so there is no deadweight loss.