


Market Structures
(Mankiw, chapter 14,15,16,17)




1

Microeconomics

- Basic concepts
- Supply, Demand and Market equilibrium
- Elasticity
- Supply, Demand and Government Policies
- International trade
- Production and Costs
- **Market structures**

2

Market structures

- Perfect competition
- Monopoly
- Monopolistic competition
- Oligopoly

3

Learning Outcomes

L.O.5 Identify, interpret, analyze and evaluate the results of different market structures

L.O.5.1 Differentiate between normal rate of return (normal profit) and economic profit.

L.O.5.2 Describe how a firm would use marginal analysis to determine a profit-maximizing level of production output in different market structures.

L.O.5.3 Compare and contrast the market structures. Give an example of each.

L.O.5.4 Demonstrate and differentiate the market structures via diagrams.

4

Market structures

Market Structure	Product	Seller Entry Barriers	Seller Number	Buyer Entry Barriers	Buyer Number
Perfect Competition	Homogenous	No	Many	No	Many
Monopolistic competition	Different	No	Many	No	Many
Oligopoly	Similar	Yes	Few	No	Many
Monopoly	No close substitute	Yes	One	No	Many

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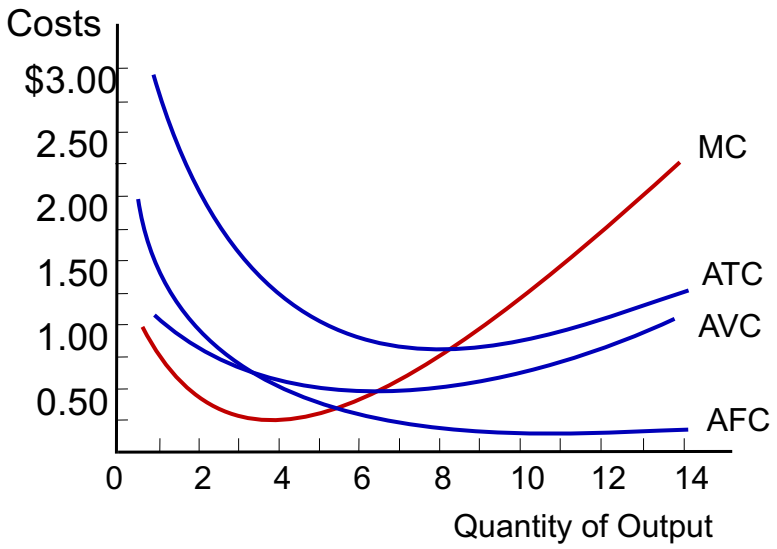
Cost curves for a typical firm



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Competitive Firm - market

- A perfectly competitive firm is one **without market power**.
  - It is not able to alter the market price of the good it produces.
  - A corn farmer is an example of a perfectly competitive firm.
- A competitive market is one in which no buyer or seller has market power.
  - High tech electronics and agricultural goods are sold in competitive markets.

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Market Power - monopoly firm

- **Market power** is the ability to alter the market price of a good or service.
  - Your campus book store has market power.
- A monopoly firm is one that produces the entire market supply of a particular good or service.
  - Your local cable TV company is an example of a monopoly firm.

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Imperfect Competition

- **Imperfect competition** is between the extremes of monopoly and perfect competition.
- In **duopoly** only two firms supply a particular product.
  - In oligopoly a few large firms supply all or most of a particular product.
- In **monopolistic competition** many firms supply essentially the same product but each has brand loyalty.

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Profit maximization

- Total revenue: TR = P x Q
- Average revenue: Total revenue divided by the quantity sold
- Marginal revenue: Change in total revenue from an additional unit sold
- Profit (π) = Total revenue (TR) – Total cost (TC)
- Maximize profit
  - Produce quantity where total revenue minus total cost is greatest
  - Compare marginal revenue with marginal cost
    - If MR > MC – increase production
    - If MR < MC – decrease production

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Perfect Competition

- **Free entry and exit** to industry
- **Homogenous** product – identical so no consumer preference
- **Large number** of buyers and sellers – no individual seller can influence price
- Sellers are **price takers** – have to accept the market price
- **Perfect information** available to buyers and sellers

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Perfect Competition

- Perfectly competitive firms are pretty much **faceless**, **no brand image**, **no real market recognition**.
- A perfectly competitive firm is one . . .
  - whose output is so **small** in relation to market volume,
  - that its **output decisions** have no perceptible impact on price.
- **Price taker**.
  - Individual firms output decisions do not affect the market price.
  - Individual firms must take the market price and do the best they can within these constraints

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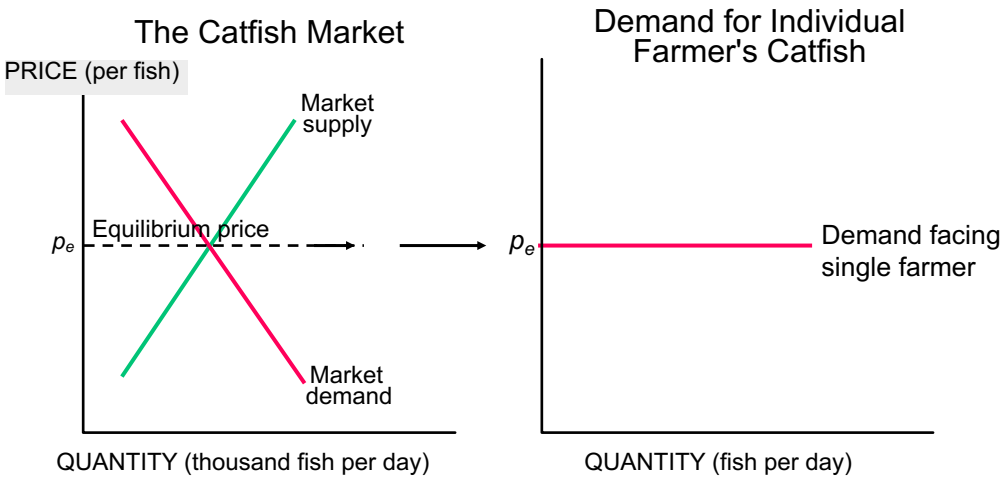
Market vs. Firm Demand



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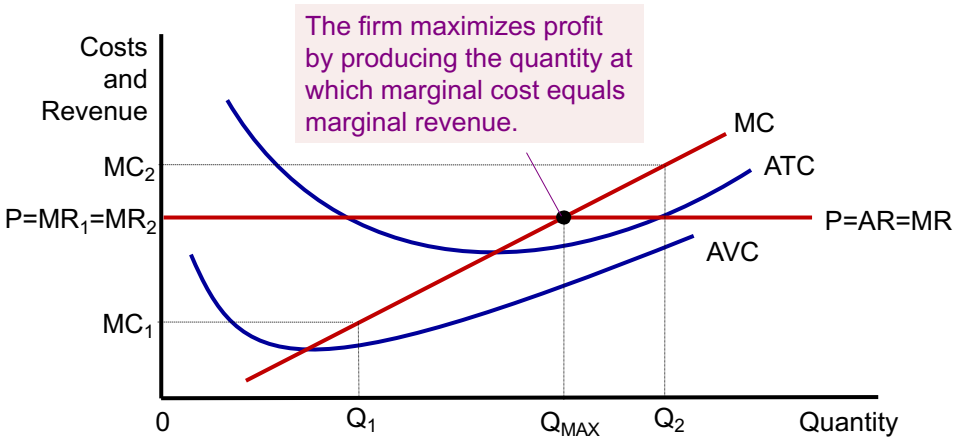
Profit maximization for a competitive firm



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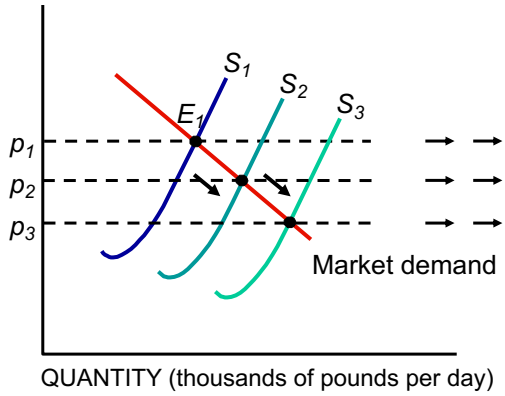
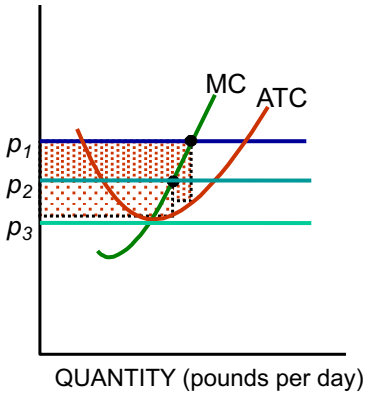
The Lure of Profits

Market entry pushes price down and . . .



Reduces profits of competitive firm



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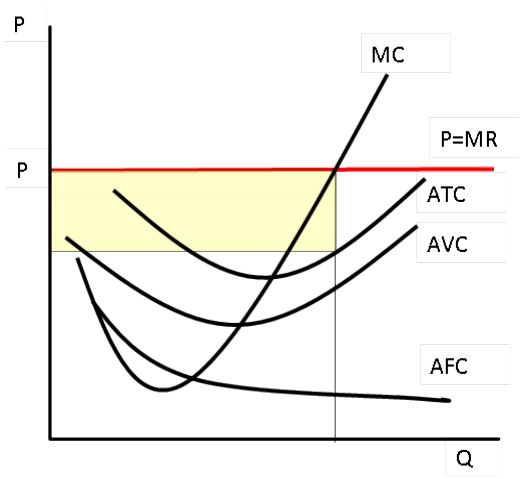
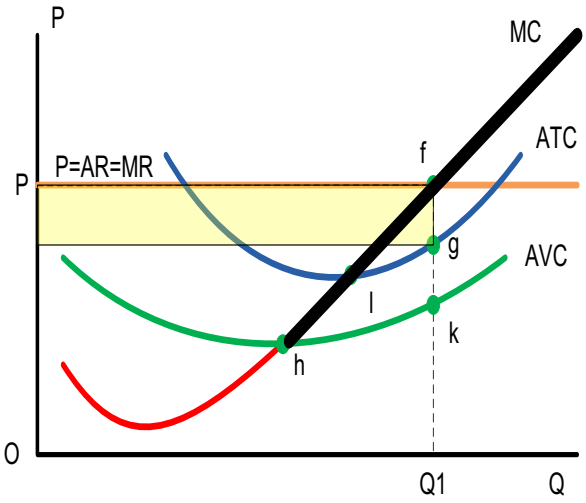
Profit maximization

Demand D = P= MR
Profit maximization: MC = MR = P
Profit: π =TR–TC=PQ–ATC*Q =Q(P-ATC)





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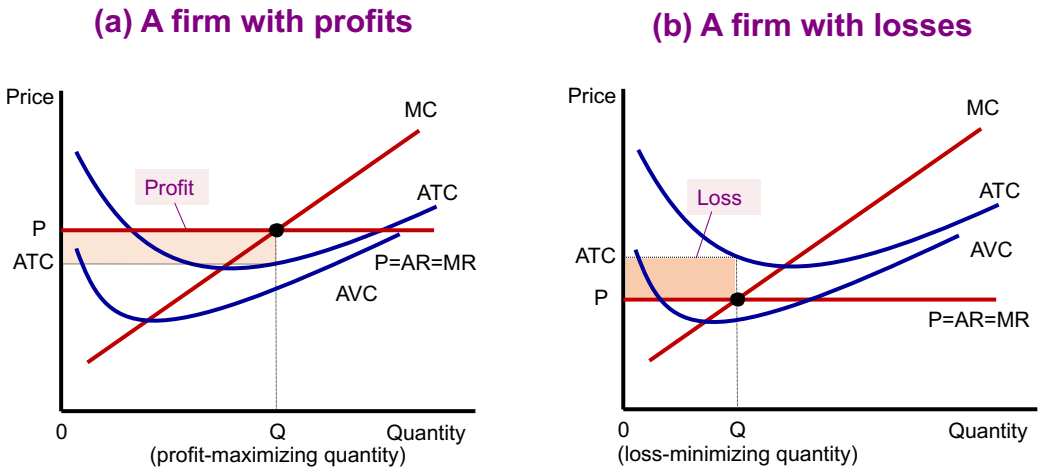
Profit as the area between price and average total cost



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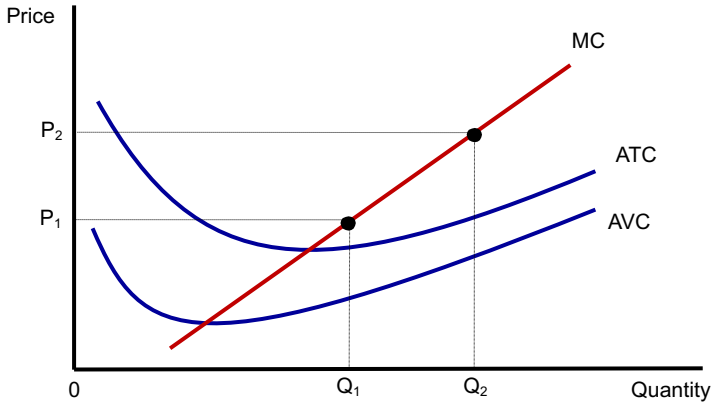
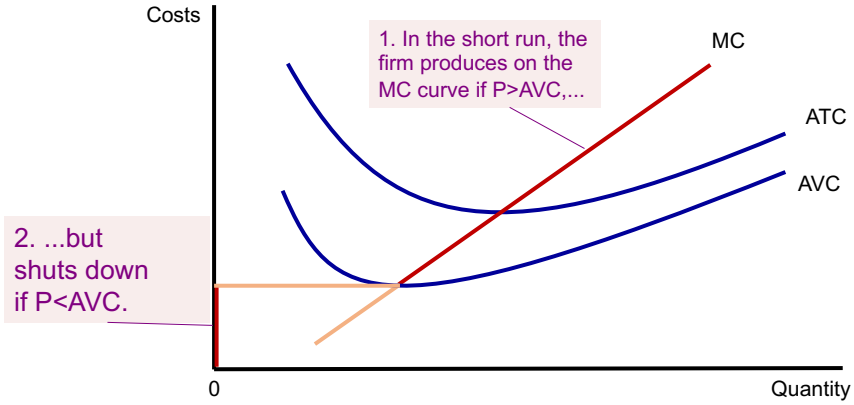
Marginal cost as the competitive firm's supply curve



An increase in the price from P_1 to P_2 leads to an increase in the firm's profit-maximizing quantity from Q_1 to Q_2. Because the marginal-cost curve shows the quantity supplied by the firm at any given price, it is the firm's supply curve.

The competitive firm's short-run supply curve



In the short run, the competitive firm's supply curve is its marginal-cost curve (MC) above average variable cost (AVC). If the price falls below average variable cost, the firm is better off shutting down.

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Profit Maximization& Competitive Firm's Supply Curve

- Shutdown
  - Short-run decision not to produce anything
    - During a specific period of time
    - Because of current market conditions
  - Firm still has to pay fixed costs
- Exit
  - Long-run decision to leave the market
  - Firm doesn't have to pay any costs

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Profit Maximization& Competitive Firm's Supply Curves

- Firm's long-run decision to exit/enter a market
  - Exit the market if
    - Total revenue < total costs; TR < TC
    - Same as: P < ATC
  - Enter the market if
    - Total revenue > total costs; TR > TC
    - Same as: P > ATC
- Competitive firm's long-run supply curve
  - The portion of its marginal-cost curve
  - That lies above average total cost

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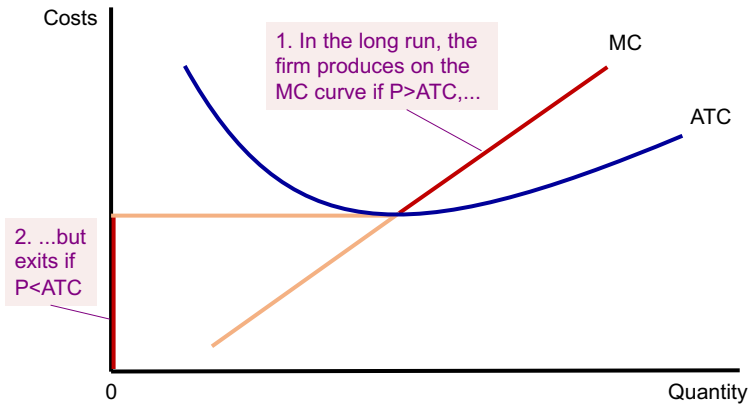
The competitive firm's long-run supply curve



In the long run, the competitive firm's supply curve is its marginal-cost curve (MC) above average total cost (ATC). If the price falls below average total cost, the firm is better off exiting the market.

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Supply Curve in a Competitive Market

- Long run: market supply with entry and exit
  - Long run – firms can enter and exit the market
  - If P > ATC – firms make positive profit
    - New firms enter the market
  - If P < ATC – firms make negative profit
    - Firms exit the market
  - Process of entry and exit ends when
    - Firms still in market: zero economic profit (P = ATC)
    - Because MC = ATC: Efficient scale
  - Long run supply curve – perfectly elastic
    - Horizontal at minimum ATC

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5. The demand curve facing a purely competitive seller is:

a. negatively sloped.
b. horizontal at the market price.
c. vertical at the market quantity.
d. the horizontal summation of all potential buyers' individual demand curves.

6. A purely competitive firm:

a. maximizes profits where MR=MC.
b. makes economic profits when its total revenue is greater than its total cost.
c. has no control over the price of its products.
d. all of the above.

7. A profit maximizing competitive firm will shut down in the short run if:

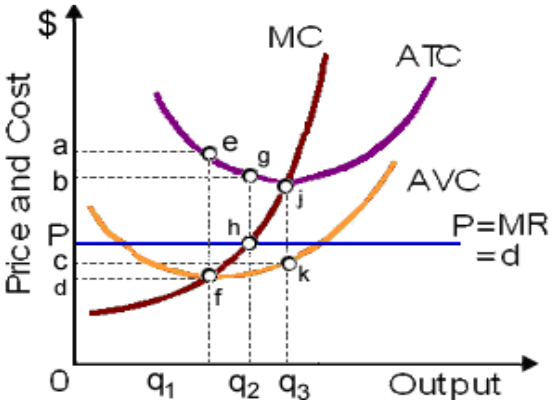
a. prices do not cover average total costs.
b. it loses money on each unit of output.
c. price falls below the minimum of its AVC curve.
d. fixed costs exceed marginal revenues.

8. Which of the following statements is not correct?

a. In a long-run equilibrium, marginal firms make zero economic profit.
b. To maximize profit, firms should produce at a level of output where price equals average variable cost.
c. The amount of gold in the world is limited. Therefore, the gold jewelry market probably has a long-run supply curve that is upward sloping.
d. Long-run supply curves are typically more elastic than short-run supply curves.

9. The competitive firm's short-run supply curve is its

a. marginal revenue curve, but only the portion where marginal revenue exceeds marginal cost.
b. marginal cost curve.
c. marginal cost curve, but only the portion above the minimum of average total cost.
d. marginal cost curve, but only the portion above the minimum of average variable cost.



10. Total Cost (TC) for this profit-maximizing pure competitor equals area:

a. 0Phq2.
b. 0bgq2.
c. Pbgh.
d. 0aeq1.

11. Total revenue (TR) for this profit-maximizing pure competitor equals area:

a. 0Phq2.
b. 0bgq2.
c. Pbgh.
d. 0aeq1.

12. This profit-maximizing pure competitor's total cost fixed TFC equals area:

a. 0Phq2.
b. 0bgq2.
c. 0aeq1.
d. daef.

13 This profit maximizng firm's total variable cost TVC. equals area:

a. 0Phq2.
b. 0bgq2.
c. 0bgq2 minus area daef.
d. daef

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14. When a restaurant stays open for lunch service even though few customers patronize the restaurant for lunch, which of the following principles is (are) best demonstrated?

(i) Fixed costs are sunk in the short run.
(ii) In the short run, only fixed costs are important to the decision to stay open for lunch.
(iii) If revenue exceeds variable cost, the restaurant owner is making a smart decision to remain open for lunch.

a. (i) and (ii) only
b. (ii) and (iii) only
c. (i) and (iii) only
d. All are demonstrated.

15. In a competitive market with identical firms,

a. an increase in demand in the short run will result in a new price above the minimum of average total cost, allowing firms to earn a positive economic profit in both the short run and the long run.
b. firms cannot earn positive economic profit in either the short run or long run.
c. firms can earn positive economic profit in the long run if the long-run market supply curve is upward sloping.
d. free entry and exit into the market requires that firms earn zero economic profit in the long run even though they may be able to earn positive economic profit in the short run.

16. In a competitive market the current price is $7, and the typical firm in the market has ATC = $7.50 and AVC = $7.15.

a. In the short run firms will shut down, and in the long run firms will leave the market.
b. In the short run firms will continue to operate, but in the long run firms will leave the market.
c. New firms will likely enter this market to capture any remaining economic profits.
d. The firm will earn zero profits in both the short run and long run.

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Monopoly

- Firm that is the sole seller of a product **without close substitutes**
- **Price maker**
- Barriers to entry
  - Monopoly resources
  - Government regulation: Government gives a single firm the exclusive right to produce some good or service
  - Government-created monopolies: Patent and copyright laws
  - The production process: Natural Monopoly

How Monopolies Make Production& Pricing Decisions

- Monopoly versus competition
  - Monopoly
    - Price maker
    - Sole producer
    - Downward sloping demand
      - Market demand curve
  - Competitive firm
    - Price taker
    - One producer of many
    - Demand – horizontal line (Price)

Monopoly profit maximization

- Demand: P = 120 - Q
- Total revenue: TR = PxQ = $120Q - Q^2$
- Marginal Revenue: MR=TR'=$120-2Q$
- Total Cost: TC = $1200 + 0.5Q^2$
- ATC = TC/Q =$1200/Q + 0.5Q$
- MC = TC'=Q
- AVC = TVC/Q=$0.5Q$
- AFC = TFC/Q=$1200/Q$

Q	P	TR	MR	TC	MC	ATC	Profit
0	120	0	120	1200	0		-1200
10	110	1100	100	1250	10	125	-150
20	100	2000	80	1400	20	70	600
30	90	2700	60	1650	30	55	1050
40	80	3200	40	2000	40	50	1200
50	70	3500	20	2450	50	49	1050
60	60	3600	0	3000	60	50	600
70	50	3500	-20	3650	70	52	-150
80	40	3200	-40	4400	80	55	-1200
90	30	2700	-60	5250	90	58	-2550
100	20	2000	-80	6200	100	62	-4200

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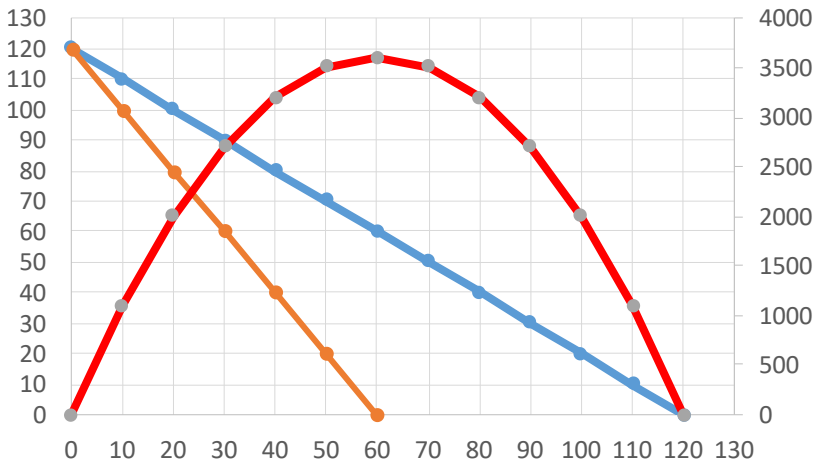
Monopoly demand

Q	P	MR	TR
0	120	120	0
10	110	100	1100
20	100	80	2000
30	90	60	2700
40	80	40	3200
50	70	20	3500
60	60	0	3600
70	50	-20	3500
80	40	-40	3200
90	30	-60	2700
100	20	-80	2000
110	10	-100	1100
120	0	-120	0

- Demand P = 120 –Q
- Total revenue: TR = PQ = $120Q - Q^2$
- Marginal revenue: MR = 120 – 2Q



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Monopoly revenue, cost, profit

Q	P	TR	TC	Profit
0	120	0	1200	-1200
10	110	1100	1250	-150
20	100	2000	1400	600
30	90	2700	1650	1050
40	80	3200	2000	1200
50	70	3500	2450	1050
60	60	3600	3000	600
70	50	3500	3650	-150
80	40	3200	4400	-1200
90	30	2700	5250	-2550
100	20	2000	6200	-4200

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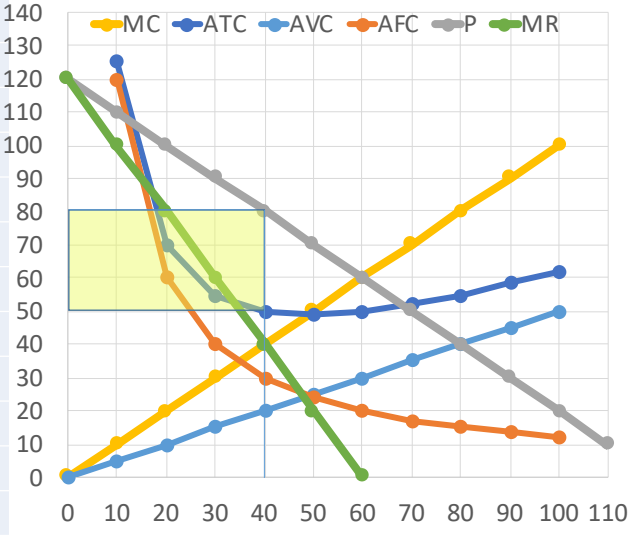
Monopoly revenue, cost, profit

Q	P	MR	MC	ATC	AVC	AFC
0	120	120	0		0	
10	110	100	10	125	5	120
20	100	80	20	70	10	60
30	90	60	30	55	15	40
40	80	40	40	50	20	30
50	70	20	50	49	25	24
60	60	0	60	50	30	20
70	50		70	52	35	17
80	40		80	55	40	15
90	30		90	58	45	13
100	20		100	62	50	12



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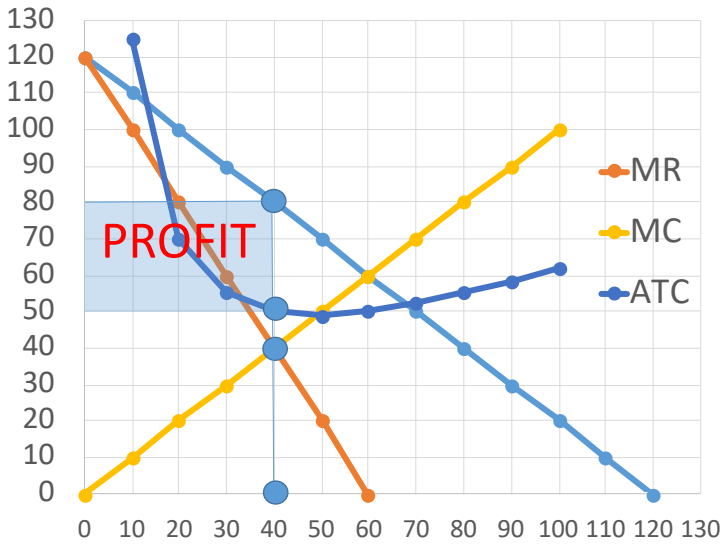
Monopoly profit maximization



Q	P	MR	MC	ATC	Profit
0	120	120	0		-1200
10	110	100	10	125	-150
20	100	80	20	70	600
30	90	60	30	55	1050
40	**80**	**40**	**40**	**50**	**1200**
50	70	20	50	49	1050
60	60	0	60	50	600
70	50	-20	70	52	-150
80	40	-40	80	55	-1200
90	30	-60	90	58	-2550
100	20	-80	100	62	-4200

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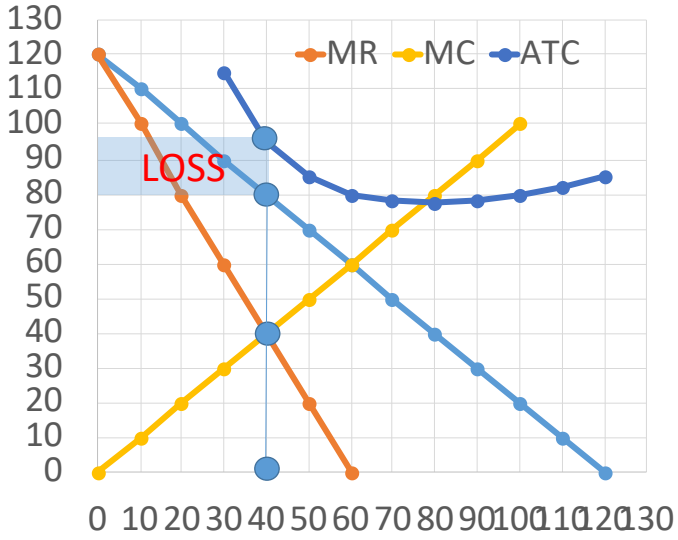
Monopoly profit maximization



Q	P	MR	MC	ATC	Profit
0	120	120	0		-3000
10	110	100	10		-1950
20	100	80	20		-1200
30	90	60	30	115	-750
40	**80**	**40**	**40**	**95**	**-600**
50	70	20	50	85	-750
60	60	0	60	80	-1200
70	50	-20	70	78	-1950
80	40	-40	80	78	-3000
90	30	-60	90	78	-4350
100	20	-80	100	80	-6000

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13. Which of the following are necessary characteristics of a monopoly?

(i) The firm is the sole seller of its product.
(ii) The firm's product does not have close substitutes.
(iii) The firm generates a large economic profit.
(iv) The firm is located in a small geographic market.

a. (i) and (iii) only
b. (i) and (ii) only
c. (i), (ii), and (iii) only
d. (i), (ii), (iii), and (iv)

14. The fundamental source of monopoly power is

a. profit.
b. decreasing average total cost.
c. barriers to entry.
d. a product without close substitutes.

16. Because monopoly firms do not have to compete with other firms, the outcome in a market with a monopoly

a. maximizes total economic well-being.
b. is efficient.
c. benefits consumers more so than the producer.
d. is often not in the best interest of society.

17. Suppose a monopolist has a demand curve that can be expressed as P=90-Q. Monopolist has constant marginal costs and average total costs of $10. The profit-maximizing monopolist will produce an output level of

a. 80 units.
b. 40 units.
c. 20 units.
d. 10 units.

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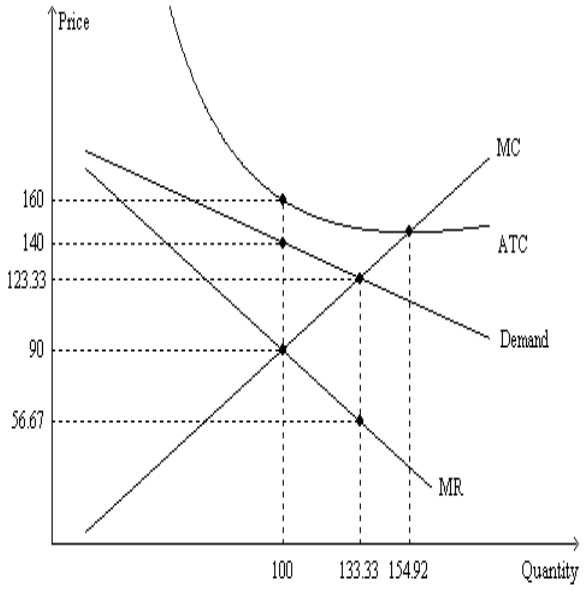

18. In order to maximize its profit, the firm will choose to produce

a. 100 units of output, and its profit will be negative.
b. 100 units of output, and its profit will be zero.
c. 133.33 units of output, and its profit will be negative.
d. 133.33 units of output, and its profit will be zero.

19. When the firm is maximizing its profit,

a. TR = $9,000 and TC =$16,000.
b. TR = $14,000 and TC =$16,000.
c. TR = $16,000 and TC =$16,000.
d. MC exceeds MR by $66.66 on the last unit of output produced.

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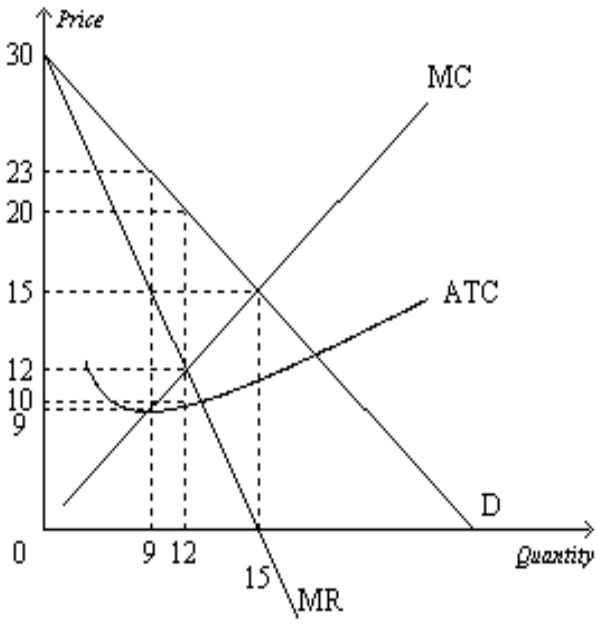

20. A profit-maximizing monopolist would charge the price at

a. $23
b. $20.
c. $15.
d. $12.

21. A profit-maximizing monopolist would earn total revenues of

a. $81.
b. $144.
c. $225.
d. $240.

22. A profit-maximizing monopolist would earn profits of

a. $96.
b. $117.
c. $120.
d. $126.

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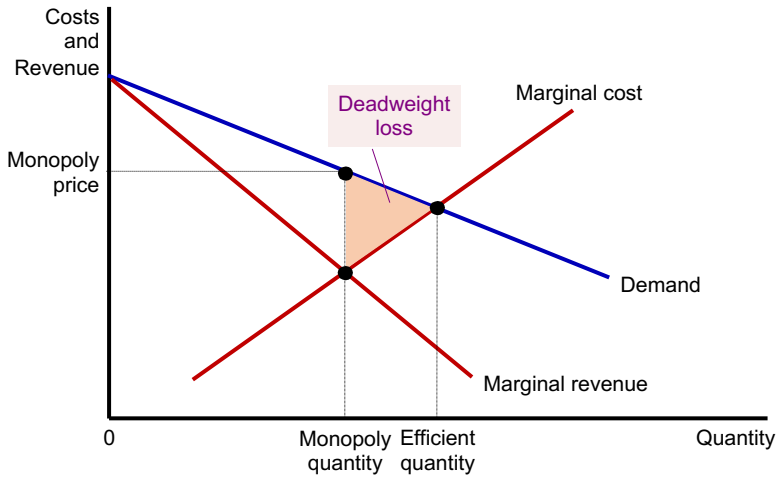
The inefficiency of monopoly



Because a monopoly charges a price above marginal cost, not all consumers who value the good at more than its cost buy it. Thus, the quantity produced and sold by a monopoly is below the socially efficient level. The deadweight loss is represented by the area of the triangle between the demand curve (which reflects the value of the good to consumers) and the marginal-cost curve (which reflects the costs of the monopoly producer).

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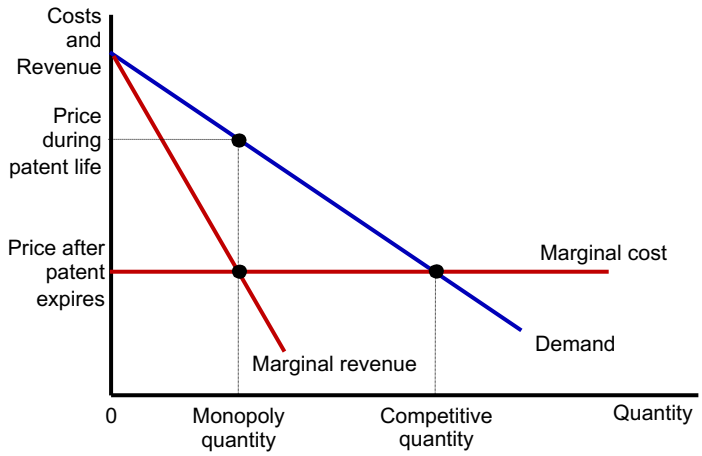
The market for drugs



When a patent gives a firm a monopoly over the sale of a drug, the firm charges the monopoly price, which is well above the marginal cost of making the drug. When the patent on a drug runs out, new firms enter the market, making it more competitive. As a result, the price falls from the monopoly price to marginal cost.

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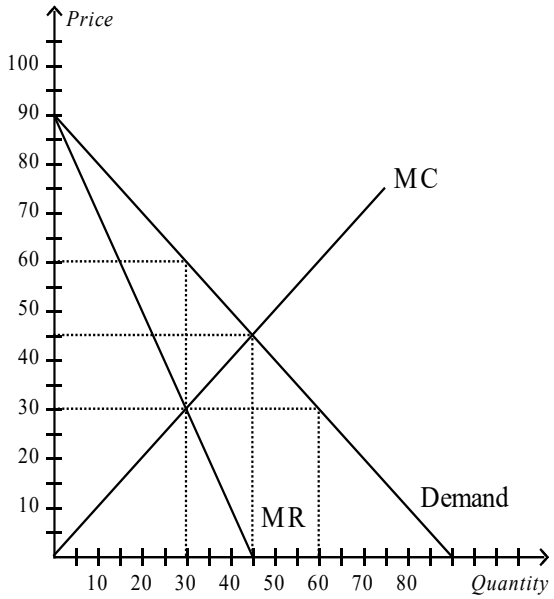

23. The consumer surplus at the monopolist's profit-maximizing price is

a. $450.
b. $900.
c. $1,350.
d. $2,025.

24. Total producer surplus of a profit-maximizing monopoly is

a. $225.
b. $450.
c. $900.
d. $1,350.

25. The deadweight loss caused by a profit-maximizing monopoly amounts to

a. $225.
b. $450.
c. $900.
d. $1,350.

40

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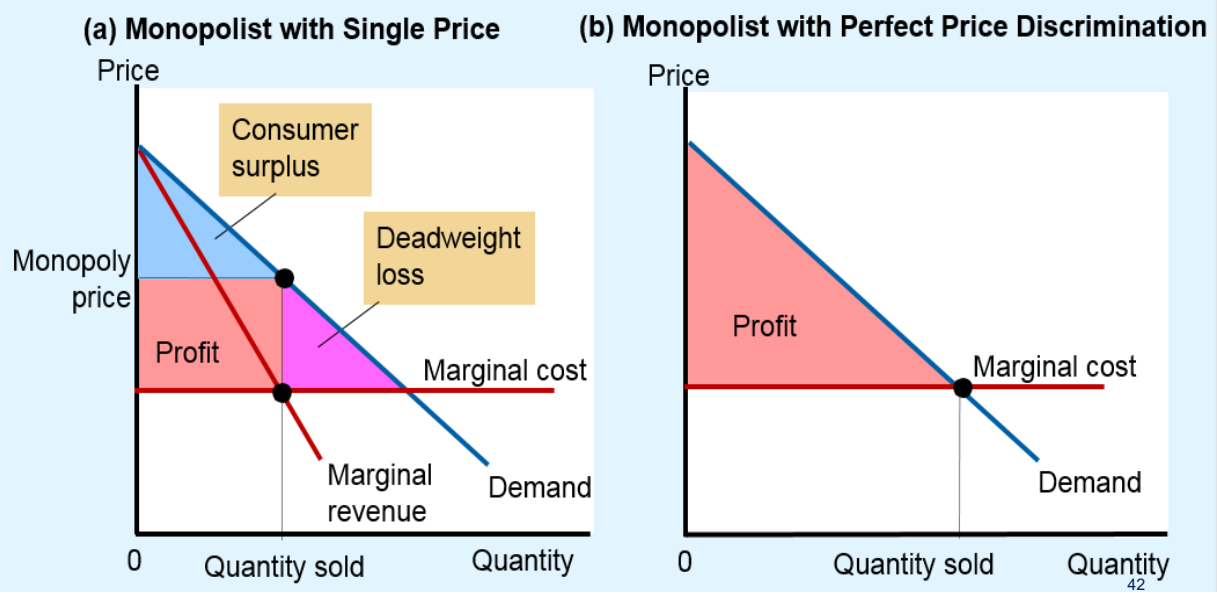
Price Discrimination

- **Price discrimination**
  - Sell the same good at different prices to different customers
  - Charges each customer a price closer to his or her willingness to pay
  - Sell more than is possible with a single price
  - Requires the ability to separate customers according to their willingness to pay.
- Examples of price discrimination
  - Movie tickets
  - Airline prices
  - Discount coupons
  - Financial aid
  - Quantity discounts

Welfare with and without Price Discrimination

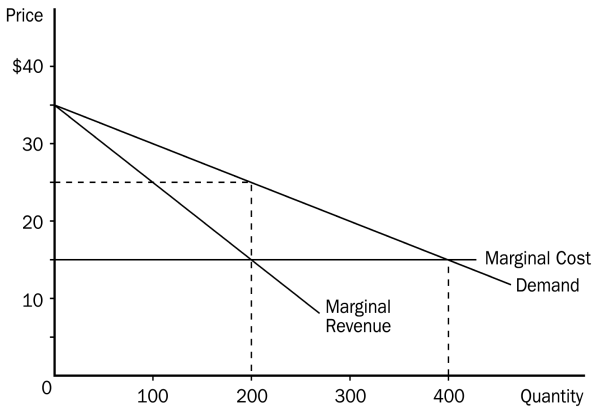


Public Policy Toward Monopolies

- Increasing competition with antitrust laws
  - Prevent companies from coordinating their activities to make markets less competitive
- Regulation: Regulate the behavior of monopolists
- Public ownership
  - How the ownership of the firm affects the costs of production
  - Private owners
    - Incentive to minimize costs
  - Public owners (government)
    - If it does a bad job: Losers are the customers and taxpayers
- Do nothing

26. Price discrimination is the business practice of

a. bundling related products to increase total sales.
b. selling the same good at different prices to different customers.
c. pricing above marginal cost.
d. hiring marketing experts to increase consumers' brand loyalty.



27. If the monopoly firm is NOT allowed to price discriminate, then the deadweight loss amounts to

a. $500.
b. $1000.
c. $1500.
d. $2,000.

28. Monopoly profit without price discrimination equals

a. $500.
b. $1,000.
c. $2,000.
d. $4,000.

29. Monopoly profit with perfect price discrimination equals

a. $500.
b. $1,000.
c. $2,000.
d. $4,000.

Monopolistic competition

- Monopolistic competition
  - Many sellers
  - Product differentiation
- Product differentiation
  - Not price takers
  - Downward sloping demand curve
- Free entry and exit
  - Zero economic profit in the long run

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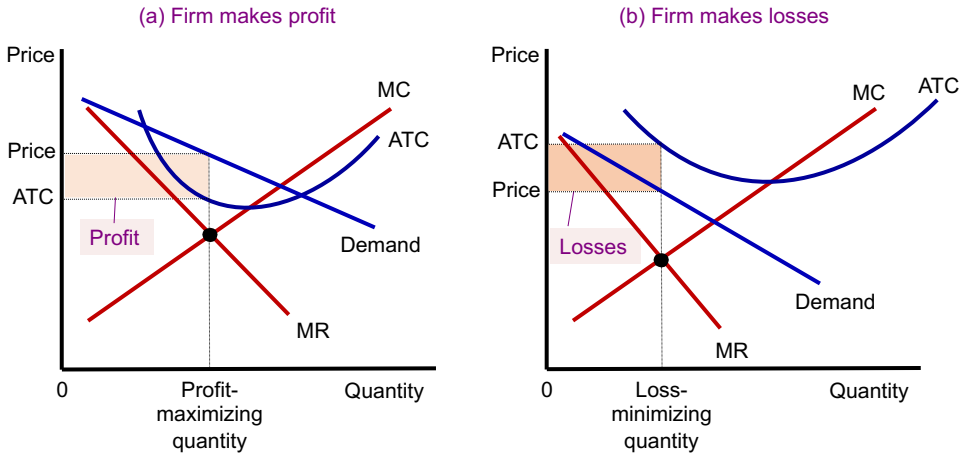
Monopolistic competitors in the short run



Monopolistic competitors, like monopolists, maximize profit by producing the quantity at which marginal revenue equals marginal cost. The firm in panel (a) makes a profit because, at this quantity, price is above average total cost. The firm in panel (b) makes losses because, at this quantity, price is less than average total cost.

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Competition with Differentiated Products

- If firms are making profit in short run
  - New firms - incentive to enter the market
  - Increase number of products
  - Reduces demand faced by each firm: Demand curve shifts left
  - Each firm's profit – declines until: zero economic profit
- If firms are making losses in short run
  - Firms - incentive to exit the market
  - Decrease number of products
  - Increases demand faced by each firm: Demand curve shifts right
  - Each firm's loss – declines until: zero economic profit

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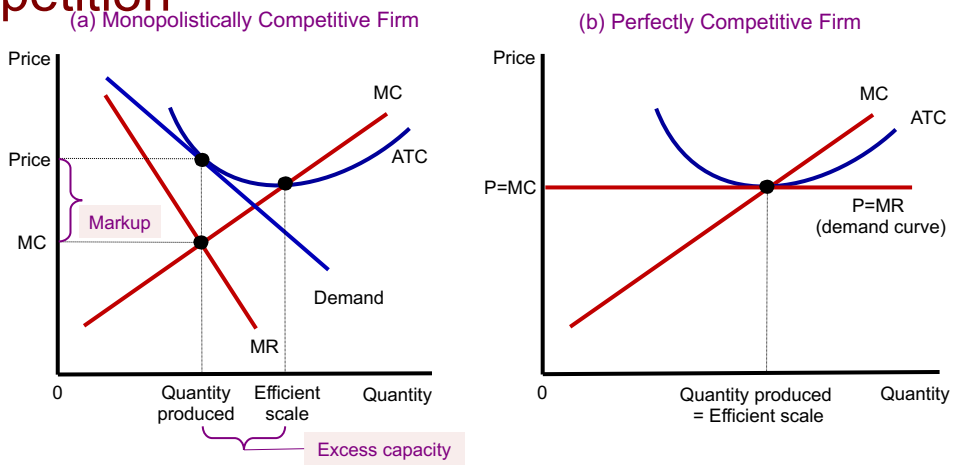
Monopolistic versus perfect competition



Panel (a) shows the long-run equilibrium in a monopolistically competitive market, and panel (b) shows the long-run equilibrium in a perfectly competitive market. Two differences are notable. (1) The perfectly competitive firm produces at the efficient scale, where average total cost is minimized. By contrast, the monopolistically competitive firm produces at less than the efficient scale. (2) Price equals marginal cost under perfect competition, but price is above marginal cost under monopolistic competition.

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Monopolistic competition & society's welfare

- Sources of inefficiency
  - Markup of price over marginal cost
    - Deadweight loss
  - Too much or too little entry
    - Product-variety externality
      - Positive externality on consumers
    - Business-stealing externality
      - Negative externality on producers
- Advertisement: to sell differentiated products at price above marginal cost => incentive to advertise to attract more buyers

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Competition with Differentiated Products

- The critique of advertising
  - Firms advertise to manipulate people's tastes
  - Impedes competition
  - Increase perception of product differentiation, Foster brand loyalty
  - Makes buyers less concerned with price differences among similar goods
- The defense of advertising
  - Provide information to customers: Customers - make better choices, Enhances the ability of markets to allocate resources efficiently
  - Fosters competition: Customers - take advantage of price differences
  - Allows new firms to enter more easily
- Advertising as a signal of quality?
- Advertising – little apparent information
  - Real information offered – a signal: Willingness to spend large amount of money = signal about quality of the product

Competition with Differentiated Products

- Firm – brand name
  - Spend more on advertising
  - Charge higher prices than generic substitutes
- Critics of brand names
  - Products – not differentiated
  - Irrationality: consumers are willing to pay more for brand names
- Defenders of brand names
  - Useful: high quality
    - Consumers – information about quality
    - Firms – incentive to maintain high quality

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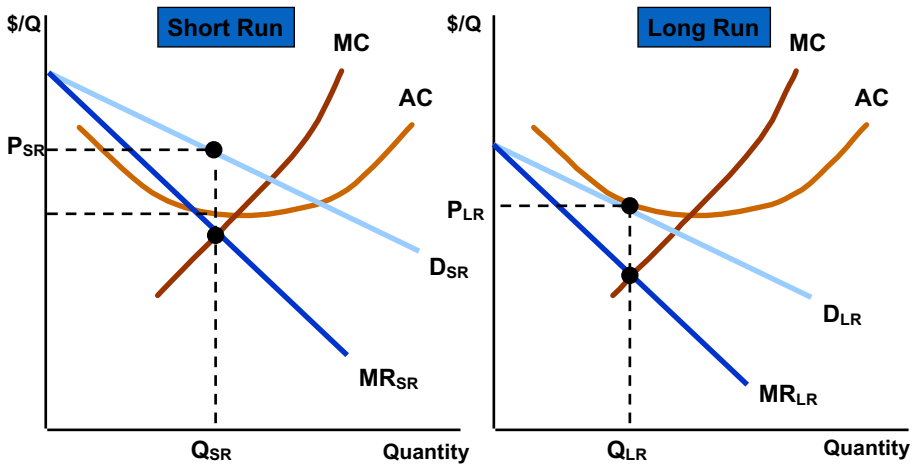
A Monopolistically Competitive Firm in the Short and Long Run



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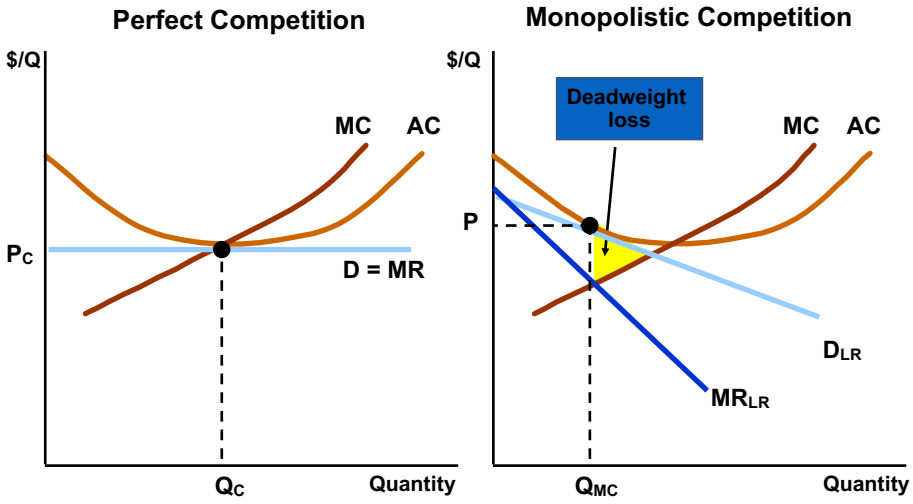
Comparison of Monopolistically Competitive Equilibrium and Perfectly Competitive Equilibrium



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Monopolistic competition: between perfect competition& monopoly

	Market structure		
	Perfect competition	Monopolistic competition	Monopoly
Features that all three market structures share			
Goal of firms	Maximize profits	Maximize profits	Maximize profits
Rule for maximizing	*MR = MC*	*MR = MC*	*MR = MC*
Can earn economic profits in the short run?	Yes	Yes	Yes
Features that monopolistic competition shares with monopoly			
Price taker?	Yes	No	No
Price	*P = MC*	*P > MC*	*P > MC*
Produces welfare-maximizing level of output?	Yes	No	No
Features that monopolistic competition shares with competition			
Number of firms	Many	Many	One
Entry in long run?	Yes	Yes	No
Can earn economic profits in long run?	No	No	Yes

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30. Which of the following statements is not correct?

a. Monopolistic competition is different from monopoly because monopolistic competition is characterized by free entry, whereas monopoly is characterized by barriers to entry.
b. Both monopolistic competition and oligopoly fall in between the more extreme market structures of competition and monopoly.
c. Monopolistic competition is different from oligopoly because each seller in monopolistic competition is small relative to the market, whereas each seller can affect the actions of other sellers in an oligopoly.
d. Both monopolistic competition and perfect competition are characterized by product differentiation.

31. Monopolistic competition differs from perfect competition because in monopolistically competitive markets

a. there are barriers to entry.
b. all firms can eventually earn economic profits.
c. each of the sellers offers a somewhat different product.
d. strategic interactions between firms are important.

32. A profit-maximizing firm in a monopolistically competitive market is characterized by which of the following?

a. average revenue exceeds marginal revenue
b. marginal revenue equals marginal cost
c. price exceeds marginal cost
d. All of the above are correct.

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33. For a profit-maximizing monopolistically competitive firm, price exceeds marginal cost in

a. the short run but not in the long run.
b. the long run but not in the short run.
c. both the short run and the long run.
d. neither the short run nor the long run.

34. When a market is monopolistically competitive, the typical firm in the market is likely to experience a

a. positive profit in the short run and in the long run.
b. positive or negative profit in the short run and a zero profit in the long run.
c. zero profit in the short run and a positive or negative profit in the long run.
d. zero profit in the short run and in the long run.

35. When an industry has many firms, the industry is

a. an oligopoly if the firms sell differentiated products, but it is monopolistically competitive if the firms sell identical products.
b. an oligopoly if the firms sell differentiated products, but it is perfectly competitive if the firms sell identical products.
c. monopolistically competitive if the firms sell differentiated products, but it is perfectly competitive if the firms sell identical products.
d. perfectly competitive if the firms sell differentiated products, but it is monopolistically competitive if the firms sell identical products.

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Measuring Market Concentration

- **Concentration ratio**: the percentage of the market's total output supplied by its four largest firms.
- The higher the concentration ratio, the less competition.
- $CR4 = \sum S_i$
- $HHI = \sum S_i^2$

Concentration Ratios in Selected U.S. Industries

Industry	CR4
Video game consoles	100%
Tennis balls	100%
Credit cards	99%
Batteries	94%
Soft drinks	93%
Web search engines	92%
Breakfast cereal	92%
Cigarettes	89%
Greeting cards	88%
Beer	85%
Cell phone service	82%
Autos	79%

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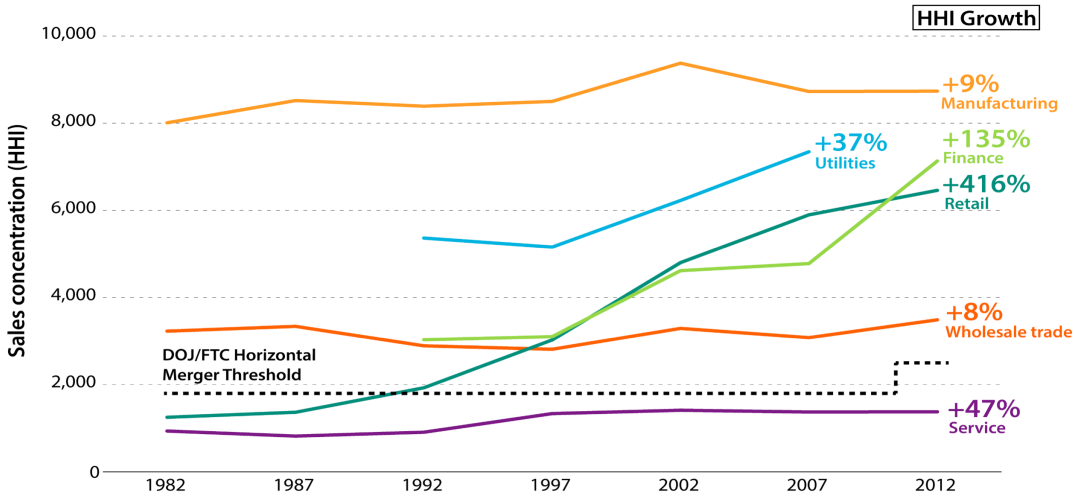
FIGURE 1.

Market Concentration and Growth by Industry, 1982–2012



Source: Autor et al. 2017.
Note: Market concentration refers to the Herfindahl-Hirschman Index (HHI; sales). After defining the boundaries of a market and calculating each firm's share (e.g., of total sales), HHI is calculated by summing the squared market shares of all firms, then multiplying the sum by 10,000. HHI growth is for the date range available (1982–2012 for all series except Utilities and Finance, which show 1992–2007 and 1992–2012, respectively). The dashed line indicates the threshold market concentration established by the U.S. Department of Justice (DOJ) and Federal Trade Commission's (FTC's) Horizontal Merger Guidelines above which a proposed merger would trigger enhanced scrutiny.

THE HAMILTON PROJECT
BROOKINGS

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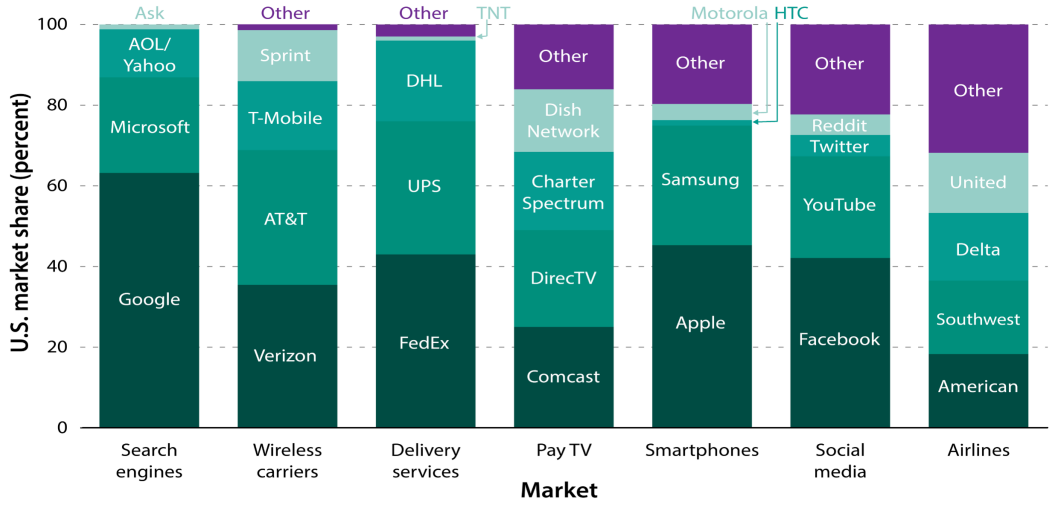
FIGURE 2.

U.S. Market Share by Firm, Selected Markets



Source: comScore 2018a, 2018b (search engines and smartphones); FierceWireless 2018 (wireless carriers); DHL 2018 (delivery services); Informitv 2018 (Pay TV); MarketingCharts 2016 (social media); Bureau of Transportation Statistics 2018a (airlines). All accessed via Statista.com.
Note: Social media shows the share of all visits; smartphones and wireless carriers show the share of subscribers; airlines show the share of domestic revenue passenger miles. Data for social media are for November 2016; data for search engines, wireless carriers, and pay TV are for December 2017; data for delivery services are for 2017 for both North and South America; data for smartphones and airlines are for January 2018. The delivery firm TNT is a subsidiary of FedEx.

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Độc quyền nhóm

Oligopoly – Competition amongst the few

- Industry dominated by small number of large firms
- Many firms may make up the industry
- High barriers to entry
- Products could be highly differentiated – branding or homogenous
- Non–price competition
- Price stability within the market - kinked demand curve?
- Potential for collusion?
- Abnormal profits
- High degree of interdependence between firms

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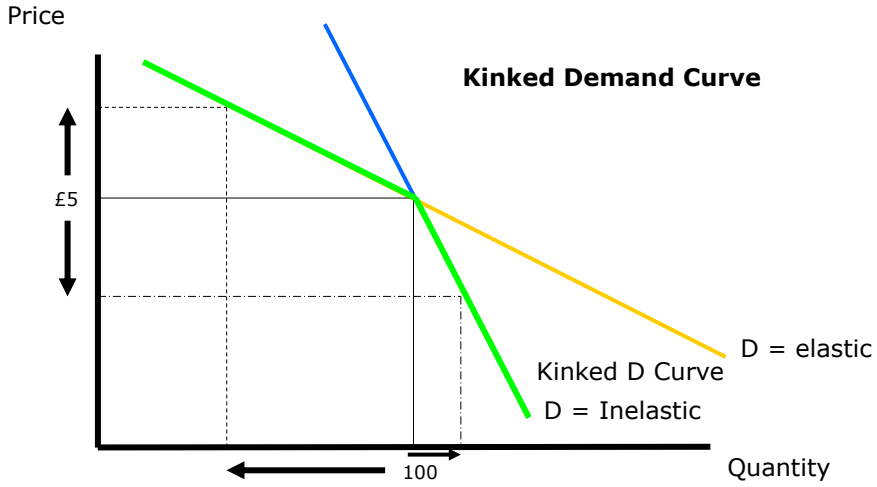
Oligopoly

Customers
Competitors
Government



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Oligopoly

- Oligopoly
  - Only a few sellers
  - Offer similar or identical products
  - Interdependent
- Game theory
  - How people behave in strategic situations
    - Choose among alternative courses of action
    - Must consider how others might respond to the action he takes

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Markets with Only a Few Sellers

- A small group of sellers
  - Tension between cooperation and self-interest
  - Is best off cooperating: Acting like a monopolist, Produce a small quantity of output
  - Each - cares only about its own profit
- Duopoly
  - Collude and form a cartel: Act as a monopoly
  - Don't collude – self-interest
    - Difficult to agree; Antitrust laws
    - Higher quantity; lower price; lower profits
    - Nash equilibrium

EXAMPLE: Cell Phone Duopoly in Smalltown

P	*Q*
$0	140
5	130
10	120
15	110
20	100
25	90
30	80
35	70
40	60
45	50

- Smalltown has 140 residents
- The "good":
  cell phone service with unlimited anytime minutes and free phone
- Smalltown's demand schedule
- Two firms: T-Mobile, Verizon
  (**duopoly**: an oligopoly with two firms)
- Each firm's costs: $FC = \$0$, $MC = \$10$

EXAMPLE: Cell Phone Duopoly in Smalltown

P	***Q***	Revenue	Cost	Profit
$0	140	$0	$1,400	–1,400
5	130	650	1,300	–650
10	120	1,200	1,200	0
15	110	1,650	1,100	550
20	100	2,000	1,000	1,000
25	90	2,250	900	1,350
30	80	2,400	800	1,600
35	70	2,450	700	1,750
40	60	2,400	600	1,800
45	50	2,250	500	1,750

Competitive outcome:
P = *MC* = $10
Q = 120
Profit = $0

Monopoly outcome:
P = $40
Q = 60
Profit = $1,800

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EXAMPLE: Cell Phone Duopoly in Smalltown

- One possible duopoly outcome: collusion
- **Collusion**: an agreement among firms in a market about quantities to produce or prices to charge
- T-Mobile and Verizon could agree to each produce half of the monopoly output:
  - For each firm: ***Q*** = 30, ***P*** = $40, profits = $900
- **Cartel**: a group of firms acting in unison, e.g., T-Mobile and Verizon in the outcome with collusion

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Collusion vs. self-interest

P	*Q*
$0	140
5	130
10	120
15	110
20	100
25	90
30	80
35	70
40	60
45	50

Duopoly outcome with collusion:
Each firm agrees to produce $Q = 30$,
earns profit = $900.

If T-Mobile reneges on the agreement and produces $Q = 40$, what happens to the market price? T-Mobile's profits?

Is it in T-Mobile's interest to renege on the agreement?

If both firms renege and produce $Q = 40$, determine each firm's profits.

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Answers

P	*Q*
$0	140
5	130
10	120
15	110
20	100
25	90
30	80
35	70
40	60
45	50

If both firms stick to agreement,
each firm's profit = $900

If T-Mobile reneges on agreement and produces $Q = 40$:
Market quantity = 70, $P = \$35$
T-Mobile's profit = 40 x ($35 – 10) = $1000

T-Mobile's profits are higher if it reneges.

Verizon will conclude the same, so
both firms renege, each produces $Q = 40$:
Market quantity = 80, $P = \$30$
Each firm's profit = 40 x ($30 – 10) = $800

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The Economics of Cooperation

- **Dominant strategy**
  - Strategy that is best for a player in a game
  - Regardless of the strategies chosen by the other players
- **Nash equilibrium**: the optimal outcome of a game is where there is **no incentive** to deviate from the initial strategy.
  - "I'm doing the best I can *given what you are doing"*
  - "You're doing the best you can *given what I am doing."*
- **The prisoners' dilemma**
  - Particular "game" between two captured prisoners
  - Illustrates why cooperation is difficult to maintain even when it is mutually beneficial

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The prisoners' dilemma

		Bonnie's decision: Confess	Bonnie's decision: Remain silent
Clyde's Decision: Confess		Bonnie gets 8 y Clyde gets 8 years	Bonnie gets 20 years Clyde goes free
Clyde's Decision: Remain silent		Bonnie goes f Clyde gets 20 years	Bonnie gets 1 year Clyde gets 1 year

In this game between two criminals suspected of committing a crime, the sentence that each receives depends both on his or her decision whether to confess or remain silent and on the decision made by the other

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Nash Equilibrium

	Firm Y Action	
Firm X Action	No price change	Price increase
No price change	**10** **10**	**-30** **100**
Price increase	**30** **-20**	**35** **140**

If X: No price change => Y: no price change

If X: Price Increase => Y: price Increase

If Y: No price change => X: no price change

If Y: Price Increase => X: price Increase

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Dominant strategy

	Firm Y Action	
Firm X Action	No price change	Price increase
No price change	**10** **10**	**-30** **100**
Price increase	**30** **-20**	**25** **140**

If X: No price change => Y: no price change

If X: Price Increase => Y: **No price change**

If Y: No price change => X: no price change

If Y: Price Increase => X: price Increase

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Maximin Strategy
(the best of the worse)

	Firm Y Action	
Firm X Action	No price change	Price increase
No price change	**10** **10**	**-30** **100**
Price increase	**30** **-20**	**35** **140**

X's worse cases: 10 or - 20 => best of worse: 10 => no price change

Y's worse cases: 10 or - 30 => best of worse: 10 => no price change

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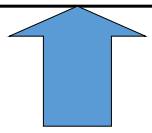
Prisoner dilemma

	Firm Y Action	
Firm X Action	No price change	Price Decrease
No price change	**10** **10**	**100** **-50**
Price Decrease	**-50** **100**	**-30** **-30**



If X: No price change => Y: Price decrease

If X: Price decrease => Y: Price decrease

If Y: No price change => X: Price decrease

If Y: Price decrease => X: Price decrease

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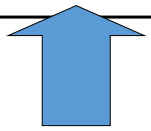
Incentive to cheat

	Firm Y Action	
Firm X Action	No price change	Price Decrease
No price change	**10** **10**	**100** **-50**
Price Decrease	**-50** **100**	**-30** **-30**



If X: No price change => Y: Price decrease

If X: Price decrease => Y: Price decrease

If Y: No price change => X: Price decrease

If Y: Price decrease => X: Price decrease

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Negative Campaign Ads

Each candidate's dominant strategy: ***run attack ads.***

R's decision

D's decision	Do not run attack ads (cooperate)	Run attack ads (defect)
Do not run attack ads (cooperate)	no votes lost or gained no votes lost or gained	R gains 1000 votes D loses 3000 votes
Run attack ads (defect)	R loses 3000 votes D gains 1000 votes	R loses 2000 votes D loses 2000 votes

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Why People Sometimes Cooperate

- When the game is repeated many times, cooperation may be possible.
- Two strategies that may lead to cooperation:
  - If your rival reneges in one round, you renege in all subsequent rounds.
  - "**Tit-for-tat**" Whatever your rival does in one round (whether renege or cooperate), you do in the following round.

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The Economics of Cooperation

- Oligopolies as a prisoners' dilemma
- Game oligopolists play
  - In trying to reach the monopoly outcome
  - Similar to the game that the two prisoners play in the prisoners' dilemma
- Firms are self-interest
  - And do not cooperate
    - Even though cooperation (cartel) would increase profits
  - Each firm has incentive to cheat

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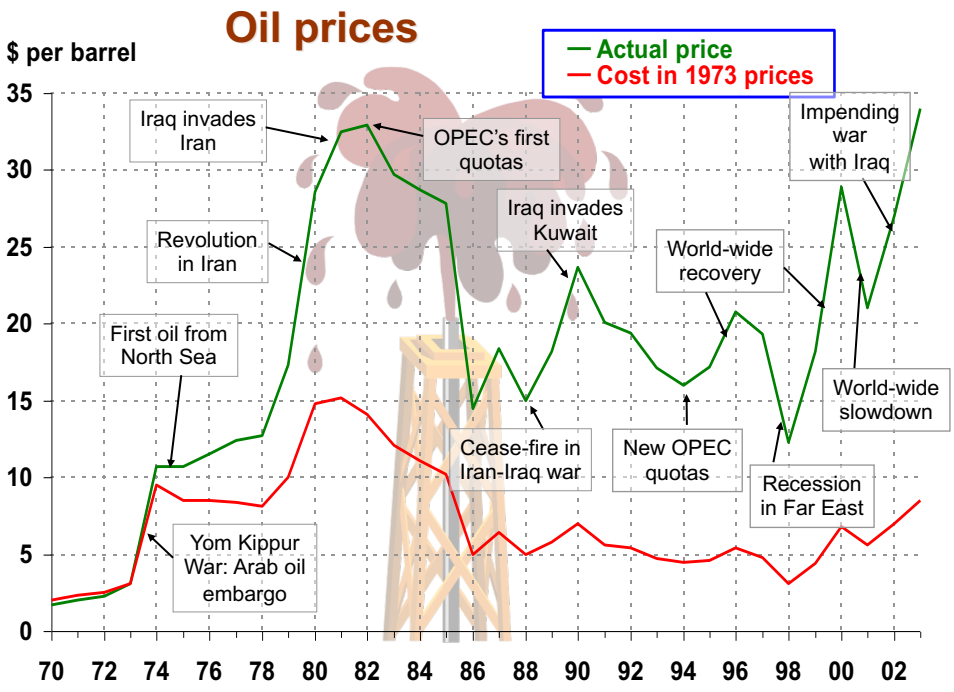
Oil prices
$ per barrel
Actual price
Cost in 1973 prices
35
30
25
20
15
10
5
0
70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02
Iraq invades Iran
OPEC's first quotas
Impending war with Iraq
Revolution in Iran
Iraq invades Kuwait
World-wide recovery
First oil from North Sea
World-wide slowdown
Cease-fire in Iran-Iraq war
New OPEC quotas
Recession in Far East
Yom Kippur War: Arab oil embargo

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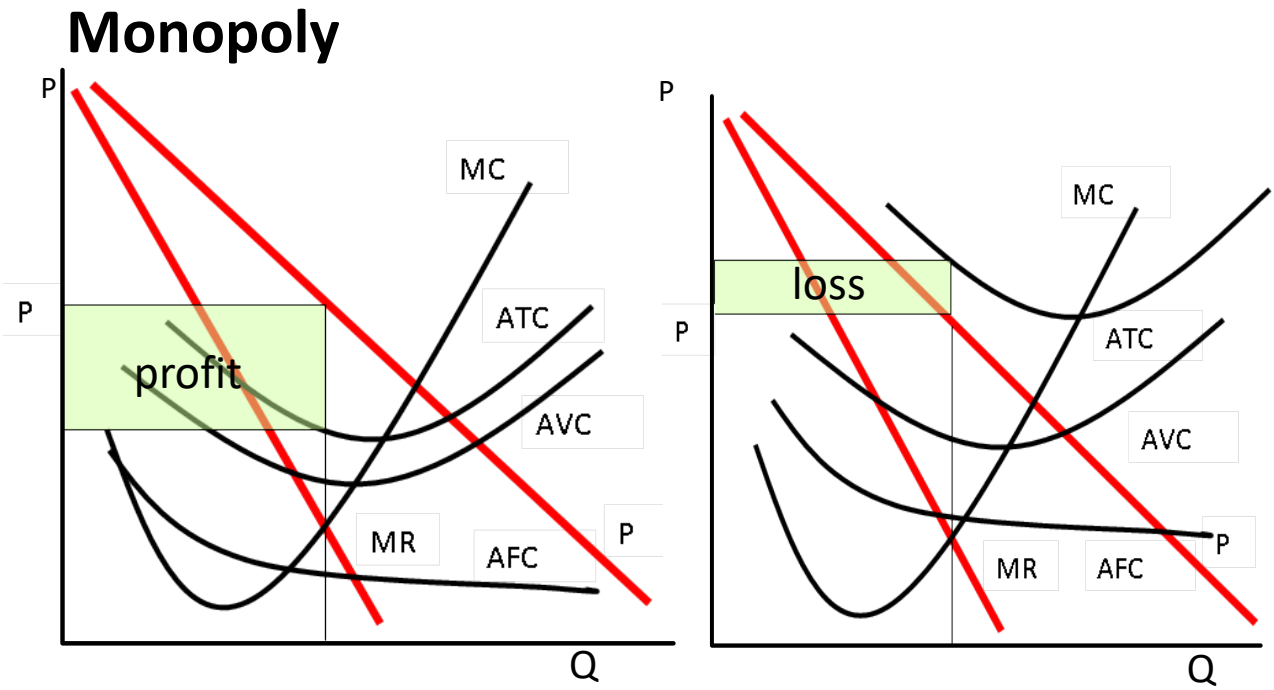
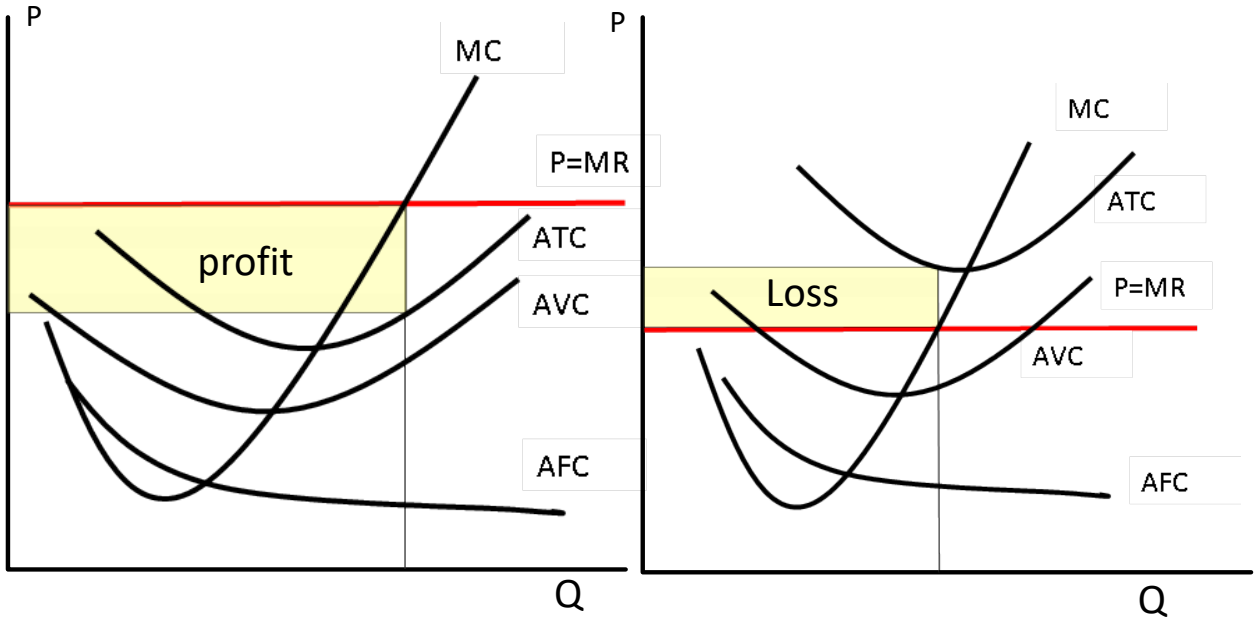

Monopoly
P
P
MC
ATC
profit
AVC
MR
AFC
P
Q
P
P
MC
loss
ATC
AVC
P
MR
AFC
Q

80

0

Perfect competition



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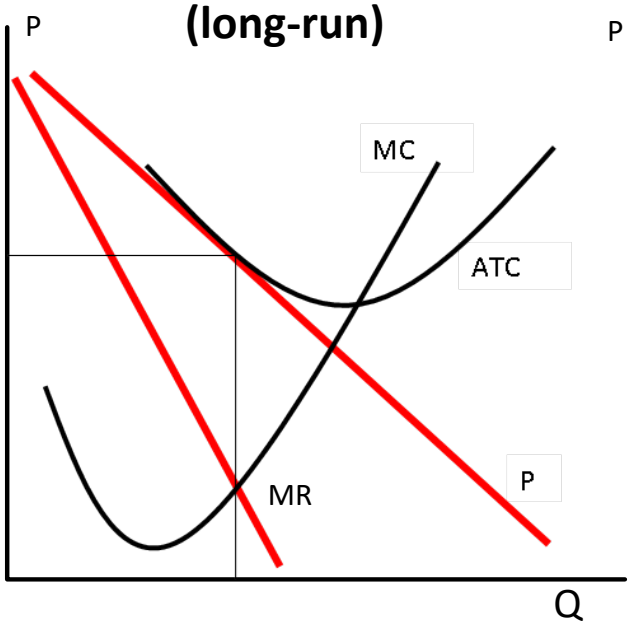
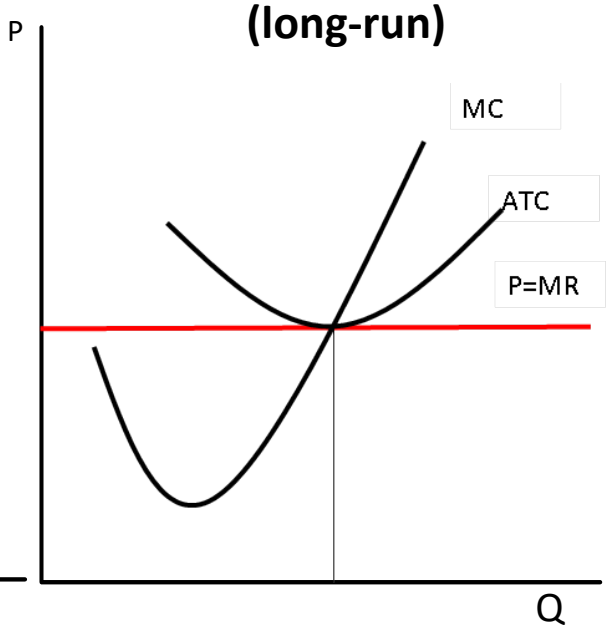
Monopolistic competition (long-run)



Perfect competition (long-run)



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