

ECONOMICS I.

Sponsored by a Grant TÁMOP-4.1.2-08/2/A/KMR-2009-0041
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June 2010



ECONOMICS I.

week 7

Monopoly

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Monopoly

Definition 0.1. Pure monopoly *is a market structure with only one firm on the market.*

- Reasons for a monopoly to emerge:
 - Efficiency (natural monopoly): the market is small compared to an efficient firm scale (e.g.: energy sector, transportation, etc.)
 - Legal boundaries
 - * Patent, Know How, copyright (e.g.: Biro (ball pen), Windows, Blood Sugar Sex Magic, Unicum, etc)
 - * Government regulation (e.g. MATÁV)
 - Barrier to entry or exit. (cost, legal, lobby, etc.)
 - The crowding out of a firm already on the market. (e.g.: Standard Oil)
- The market structure can change. A firm can be alone in a market at one period, while others can enter the market later (e.g. IBM).
- A pure monopoly is only a model, which we can use as good proximation in certain situations.
- If a firm is alone on a market, then it is NOT PRICE TAKER! What would its revenue and profit be?

Note 0.2. *Costs depend on the technology and not on the market structure. But on the long run, in certain markets, a firm with strong market power can change its technology easier, and thus lower its costs.*

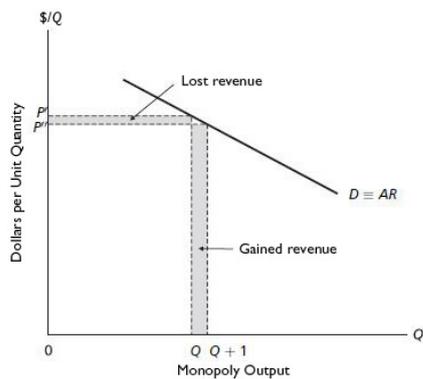
1 The optimum of the monopoly

Marginal revenue of the monopoly

- Monopoly is not price taker
- Thus it does not take price as constant
- $\frac{dP}{dq} \neq 0$, where $P(q)$ is the inverse demand function
- Then $MR(q) = \frac{dP(q)}{dq}q + P(q)$
- If the law of demand holds, i.e. $\frac{dP}{dq} < 0$, then $MR(q) < P(q)$, i.e. marginal revenue is under the inverse demand curve.

Marginal revenue

Changing the quantity does not always change revenue with the same amount.

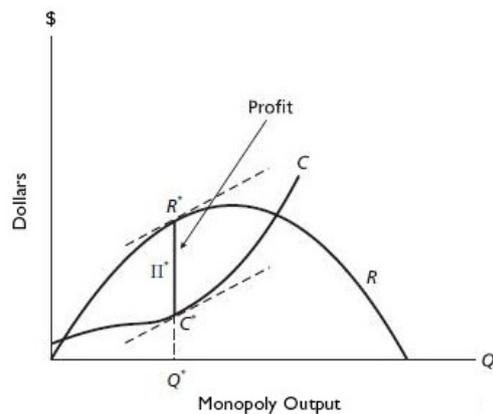


Statement 1.1. Given any linear demand curve $P = A - BQ$, marginal revenue is $MR = A - 2BQ$. (So the MR curve starts at the vertical intercept of the demand curve on the P-axis and then falls twice as fast as the demand curve.)

Monopolist's profit-maximizing optimum

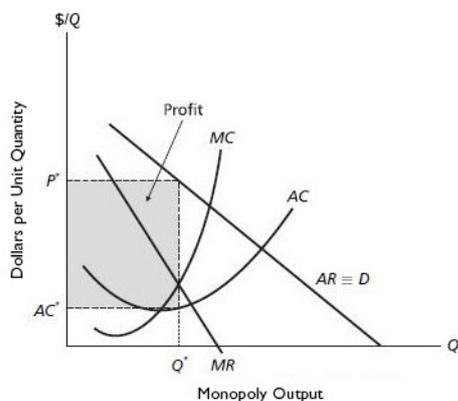
Profit maximum

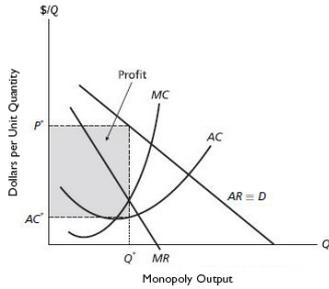
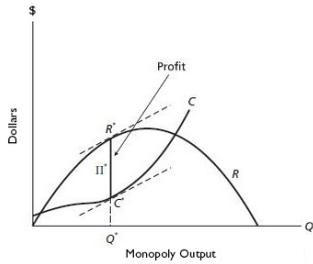
Maximum profit occurs, where the vertical difference between the total revenue and the total cost curve is the greatest. The revenue curve is non-linear because the firm is not price-taker.



Profit-maximizing output

The profit-maximizing output q^* of the monopoly is, where marginal cost intersects with the marginal revenue curve $MR = MC$. Profit-maximizing price is given by the demand curve at q^* .





Statement 1.2. A profit-maximizing monopoly firm always chooses a price-quantity solution in the range of elastic demand along the market demand curve.

2 Monopoly and welfare

Competition versus monopoly

$$(P = 132 - 8q/100; C = 100[128 + 69Q/100 - 14(Q/100)^2 + (Q/100)^3])$$

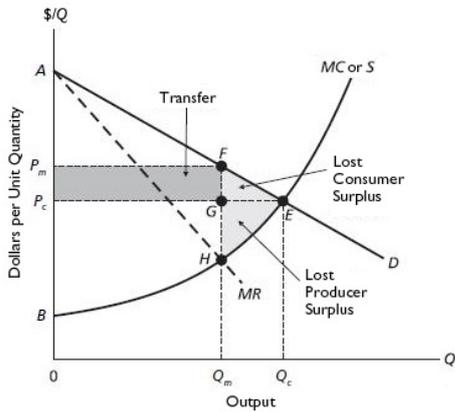
Q	P	R	MR	C	MC (exact)	η
0	132	0	132	12 800	69	$-\infty$
100	124	12 400	116	18 400	44	-15,5
200	23 200	100	21 800	25	-7,25	
300	108	32 400	84	23 600	12	-4,5
400	100	40 000	68	24 400	5	-3,125
500	92	46 000	52	24 800	4	-2,3
600	84	50 400	36	25 400	9	-1,75
700	76	53 200	20	26 800	20	-1,36
800	68	54 400	4	29 600	37	-1,06
900	60	54 000	-12	34 400	60	-0,83
1000	52	52 200	-28	41 800	89	-0,65
...						

Statement 2.1. The monopoly output solution occurs where marginal cost = marginal revenue. Since competitive firms produce where marginal cost = price and since marginal revenue < price, a monopolized industry charges higher price and produces smaller output than a competitive industry with the same cost and demand functions.

Monopoly and economic efficiency

Deadweight-loss

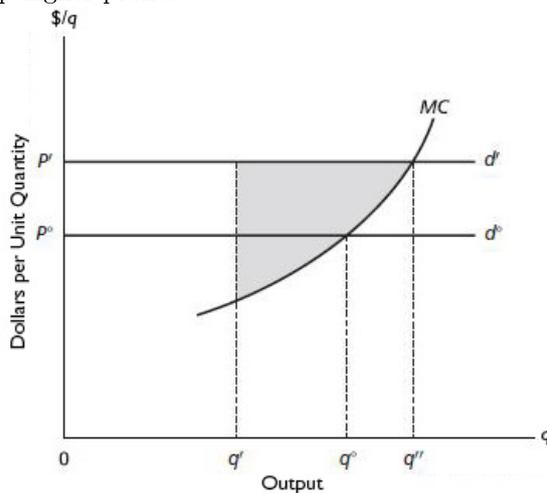
Monopoly produces deadweight-loss (the area of the FHE triangle), which is due to the fact that the monopoly is not a price-taker (and not due to the "evil" nature of the firm).



Statement 2.2. *In comparison with the competitive outcome, monopoly involves a transfer from consumers to suppliers. There is also an efficiency loss, the sum of the reduction in consumer surplus and producer surplus due to reduced trade.*

Cartels

A cartel is a group of firms behaving as a collective monopoly. Each firm in a cartel agrees to produce less than it would under unrestrained competition. The aim is of course to raise the price so that all can reap higher profits.



Consequence 2.3. *Cartels can raise prices above the competitive level only by cutting industry output. But at the higher prices, a member firm can profit by covertly producing even more than at the competitive equilibrium. Nonmembers can do the same and, since they need not disguise their actions, can gain even more. The added production of members and of nonmembers combine to subvert the cartel.*

Government intervention to decrease welfare loss

- Competition policy
- State takeover
- Economic regulation

Competition policy

The first famous regulation in competition policy: Sherman Act (1890)

- 1. section. Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to

be illegal. Every person who shall make any contract or engage in any combination or conspiracy hereby declared to be illegal shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$100,000,000 if a corporation, or, if any other person, \$1,000,000, or by imprisonment not exceeding 10 years, or by both said punishments, in the discretion of the court.

- 2. section. Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$100,000,000 if a corporation, or, if any other person, \$1,000,000, or by imprisonment not exceeding 10 years, or by both said punishments, in the discretion of the court.

Later provisions (USA):

- Rule of Reason
- Clayton-act: 1914
- Federal Trade Commission: 1914

Indicted industry cartels – price movements after indictment

	Number of cases	Prices rose	Prices fell	Unclear or mixed
Before 1976	10	7	1	2
After 1976	15	9	2	5

Eu

Hungary:

- Competition act (1996/LVII. act)
- Hungarian Competition Authority (GVH): independent organization (+sector specific regulatory bodies)
- Main areas in competition-regulation:
 - Prohibition of the agreements limiting competition (cartel (horizontal≠vertical), vertical restrictions, firm agreements): e.g.: Insurance companies (6,8 billion HUF fine!) (2006), Movie-cartel (2002), "Pacal"-cartel (2001), Highway-cartel (2006)
 - Abuse of market power: Pl.: Microsoft, OTP
 - Prohibition of unfair competition
 - Deceit of consumers (not consumer but competition protection)
 - Controlling mergers
- How can we achieve that the actors do not have a reason to limit competition? (If we know the desired equilibrium, how do we set the rules of the game, so that this equilibrium emerges?)
- Tools: laws, regulations, provisions, organizations, concessions, etc.

3 Price discrimination

Price discrimination

Decision problems of the company in business (if it is considered as a separate decision-maker):

- Examples for monopolistic behaviors
 - Pricing(should 12 straws of rose cost the same as 12*1 straw? what about occasions such as mothers' day?: Price discrimination)

- Choosing the product (should menu be in the restaurant or only á la carte? should one menu be? should meals cost always the same?): Quality, product range, tie-in sale, package-sale

- Examples for strategic behavior

- Marketing, product support, advertising, etc. (Tisza shoes?): It contains strategic elements
- Market stretching (OTP in Croatia?): It contains strategic elements

1st example: How to determine the price of tickets? (Veszprém Zoo, 2010)

- Single:

- Child (age between 3-18) 1050 HUF
- Student (older than 18) 1370 HUF
- Adult 1560 HUF
- Pensioner 1050 HUF

- Group:

- Child (age between 3-18) 920 HUF
- Student (older than 18) 990 HUF
- Adult 1400 HUF
- Pensioner 920 HUF

2nd example: How to determine cell phone charges of a package? (T-Mobile, 2010, Domino Active package)

- Within the T-mobile network:

- Within peak periods 26 HUF
- Outside peak periods 16 HUF

- In domestic fixed lines:

- Within peak periods 26 HUF
- Outside peak periods 16 HUF

- In other mobile directions:

- Within peak periods 36 HUF
- Outside peak periods 26 HUF

- Linear pricing (third degree price discrimination)

- Non-linear pricing (first and second degree price discrimination)

- Individual pricing
- Multiple pricing
- Block pricing
- Quantity discounts

Conditions of price discrimination:

- The company market has market power
- Information of the consumers' willingness to pay (of price sensitivity or demand function)
 - Definition of consumer-groups: Market segmentation

- Identification of consumers (or self-selection incentive contract menu), classification into consumer-groups
- Prevention and restriction of reselling the product (arbitrage)
- In case of consumption the personality of the consumer can be identified: mostly in case of direct connection between buying and consuming
 - Services
 - Non-storable goods (e.g. electricity, gas)
- Restrictions tied in contract
 - Abolition of guarantee
 - Prohibition of re-selling by contracts
- Product modification (eg. drugstore alcohol)
- Increase of transactional costs: Searching, travelling, transportation, etc. costs)

Market segmentation

Suppose the company divides the customers into two or more segments, offering different prices (quantities) to different classes of buyers.

Linear pricing

Prices and quantities set in certain segments:

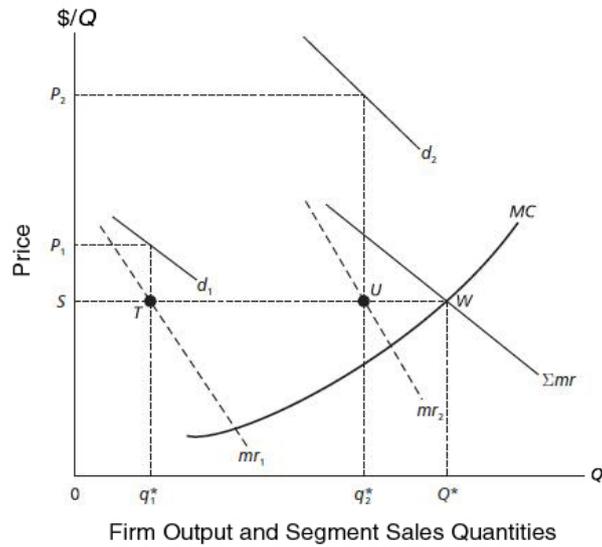
- First segment: P_1, Q_1
- Second segment: P_2, Q_2

$$\begin{aligned}\Pi &= R_1(Q_1) + R_2(Q_2) - C(Q_1 + Q_2) \rightarrow \max \\ \Pi &= P_1(Q_1)Q_1 + P_2(Q_2)Q_2 - C(Q_1 + Q_2) \rightarrow \max\end{aligned}$$

Optimum condition:

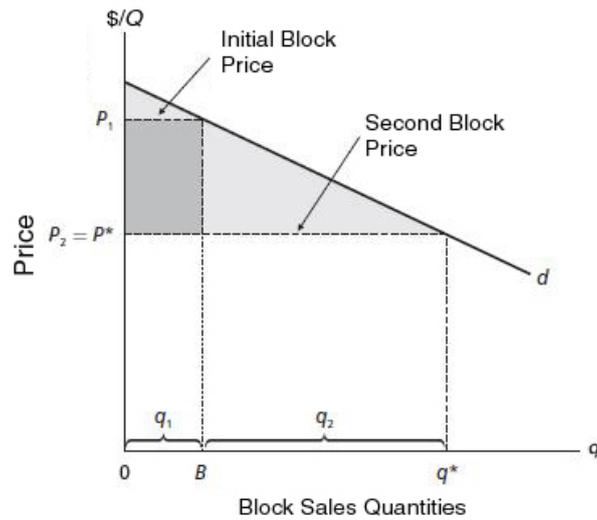
$$\begin{aligned}\frac{\partial \Pi}{\partial Q_1} &= 0, \frac{\partial \Pi}{\partial Q_2} = 0 \\ mr_1 &= mr_2 = MC \\ P_1 \left(1 + \frac{1}{\eta_1}\right) &= P_2 \left(1 + \frac{1}{\eta_2}\right) \\ P_1 \left(1 + \frac{1}{\eta_1}\right) &= P_2 \left(1 + \frac{1}{\eta_2}\right)\end{aligned}$$

Statement 3.1. *Under market segmentation, the segment with more elastic demand will be charged a lower price.*



Non-linear pricing

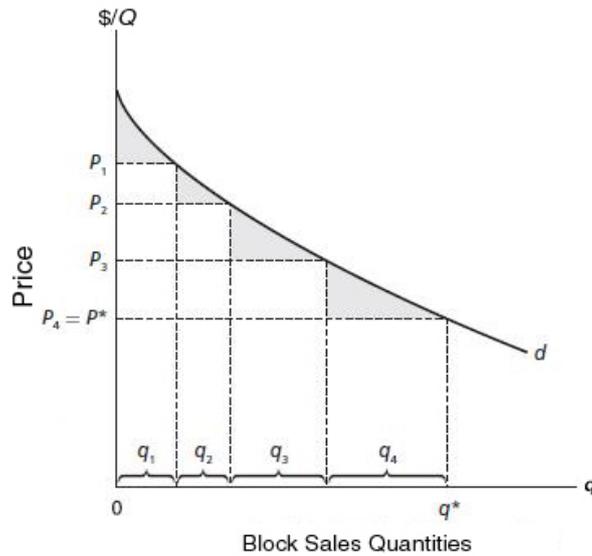
Whereas in market segmentation the seller charges different prices to different customers, in block pricing the seller charges different prices to a single customer. For example, a 1-pound package of detergent might sell for \$1.00 while a 2-pound package sold for \$1.50. The seller is charging \$1.00 for the first pound bought and \$0.50 for the second pound.



Perfect Discrimination

Four-Part Pricing

In case of perfect price discrimination, the company charges a different price (which equals to the reservation prices of consumers) for each successive unit bought by each consumer. (e.g. auction) In this case the company applies a four-part pricing schedule.



Perfect Discrimination

- It can be applied in such cases when access to the good and different units of the good can be charged too. (e.g. network services)
- 1st part: Lump sum 'access fee' for the right to buy (T)
- 2nd part: Unit-price paid for the bought units of product (p)
- Can be an instrument of price discrimination (first and second degree price discrimination)
- All consumer surplus can be skimmed if
 - Consumers are the same
 - Consumers can be identified
 - In this case perfect (first degree) price discrimination exists

1. E.g.: Disco

- Defining prices of drinks (linear pricing)
- Defining the entrance fee (access charge)+ drink prices (unit charge) (two-part pricing)
- Entrance fee + coupons (amount that can be consumed) + defining drink prices (block pricing)

2. E.g.: Cell phone charges

- Defining per-minute rate of calls (linear pricing)
- Defining monthly fee + per-minute fee (two-part pricing)
- Defining monthly fee + amount of minutes can be applied + per-minute charges (block pricing)