6. MONOPOLY

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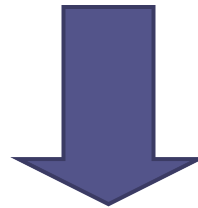
Monopoly characteristics

- monopoly IS a type of competition (competition accross the market)
- existence of SOLE subject on the supply side
- restricted entry
- monopoly is a „price maker“
- no close substitutes to the monopoly´s production
- individual demand curve = market demand curve

Causes of monopoly existence – increasing returns to scale

increasing returns to scale – decreasing AC:

- *sole firm is able to satisfy the entire market demand more effectively than in case of many firms in the industry*
- *cause: relatively high fixed costs (mostly infrastructure) to the individual demand*



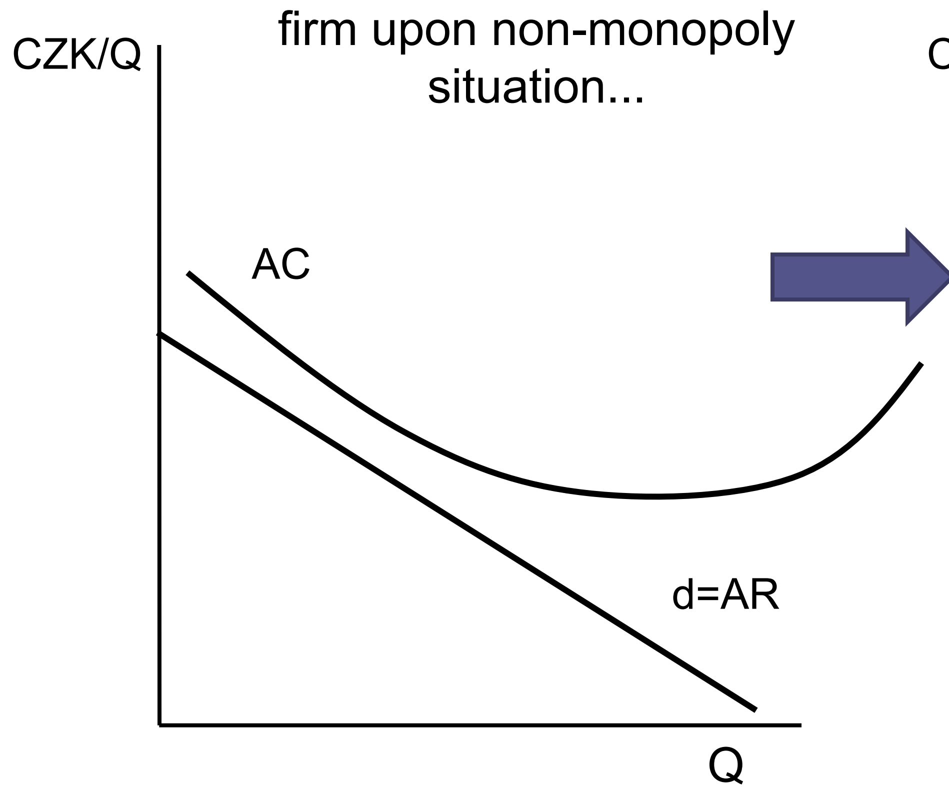
NATURAL MONOPOLY

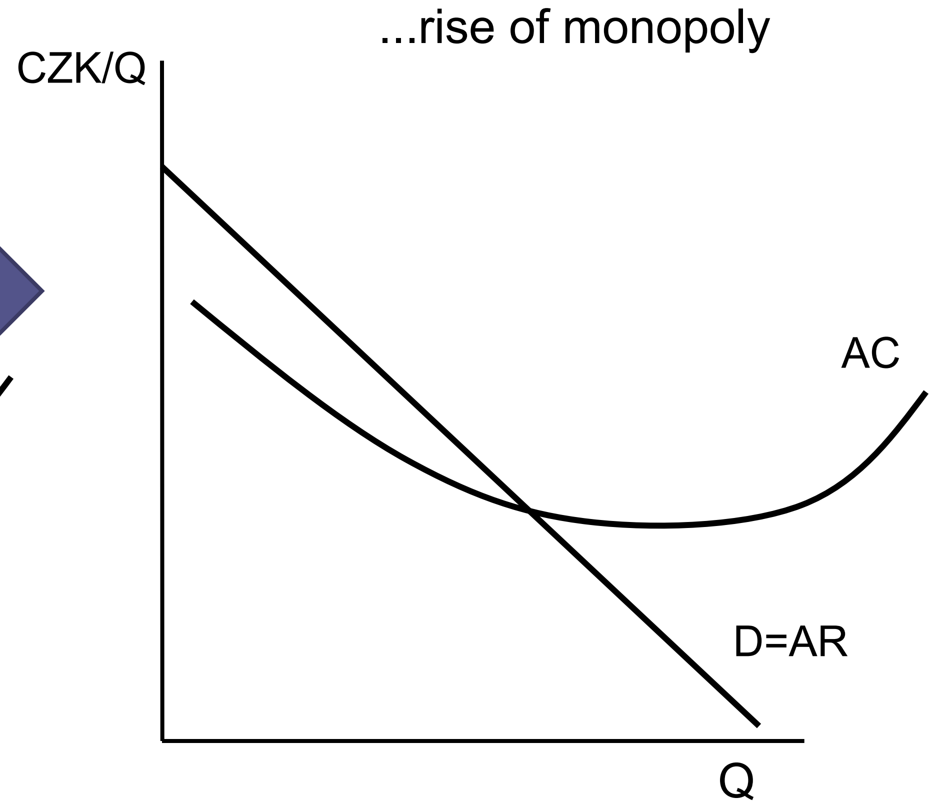
typically network industries (water-supply, sewer systems etc.)

Natural monopoly

- ≠ natural resources monopoly
- eventual demonopolization would lead to the monopoly anyway... because:
- each firm would attend relatively low demand upon high costs
- typical: minimum of AC lies above the individual demand curve
- usually highly profitable industry → motivation to enter the industry → investments into research → technological progress → costs decrease → dismantling the entry barriers (i.e. telecommunication)

Natural monopoly – endeavour to demonopolization





Upon non-monopoly conditions a specific firm cannot exist – AC always higher than AR, due to relatively low market share

Monopoly as a natural result – the sole firm is able to attend more effectively the market demand

Causes of monopoly existence – natural resources monopoly

- *the sole firm controls (owns) all natural resources needed to produce the specific good*
- example:...???

Causes of monopoly existence – artificial monopoly

State intervention:

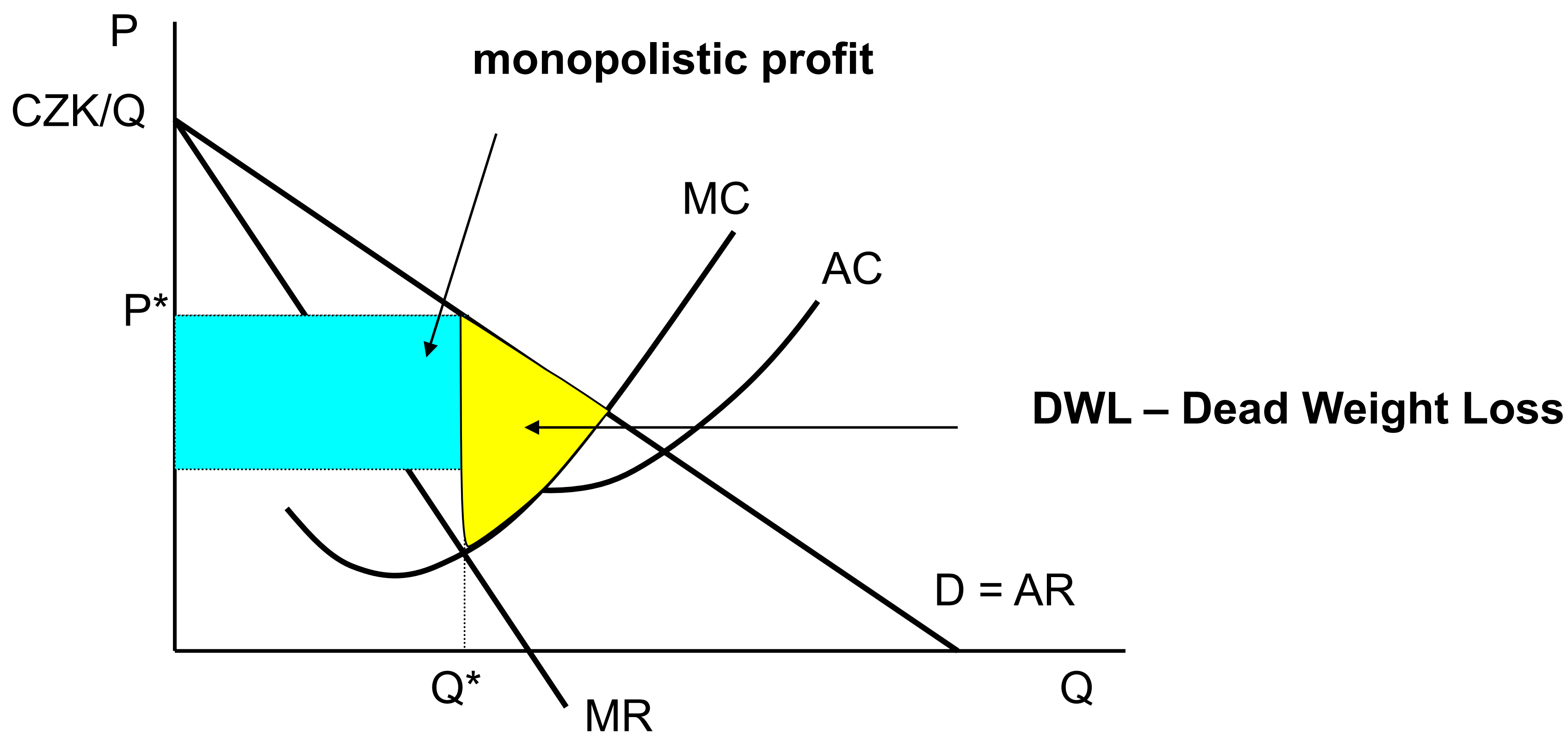
- *state grants an exclusive right to produce a specific good to the only firm, or:*
- *state founds a monopoly firm in a specific industry*

- i.e.: Czech Post (missive delivery),
  Central banks (banknotes and coins emission)

Copyrights, patents

Monopoly equilibrium

Q maximizing economic profit: MR = MC

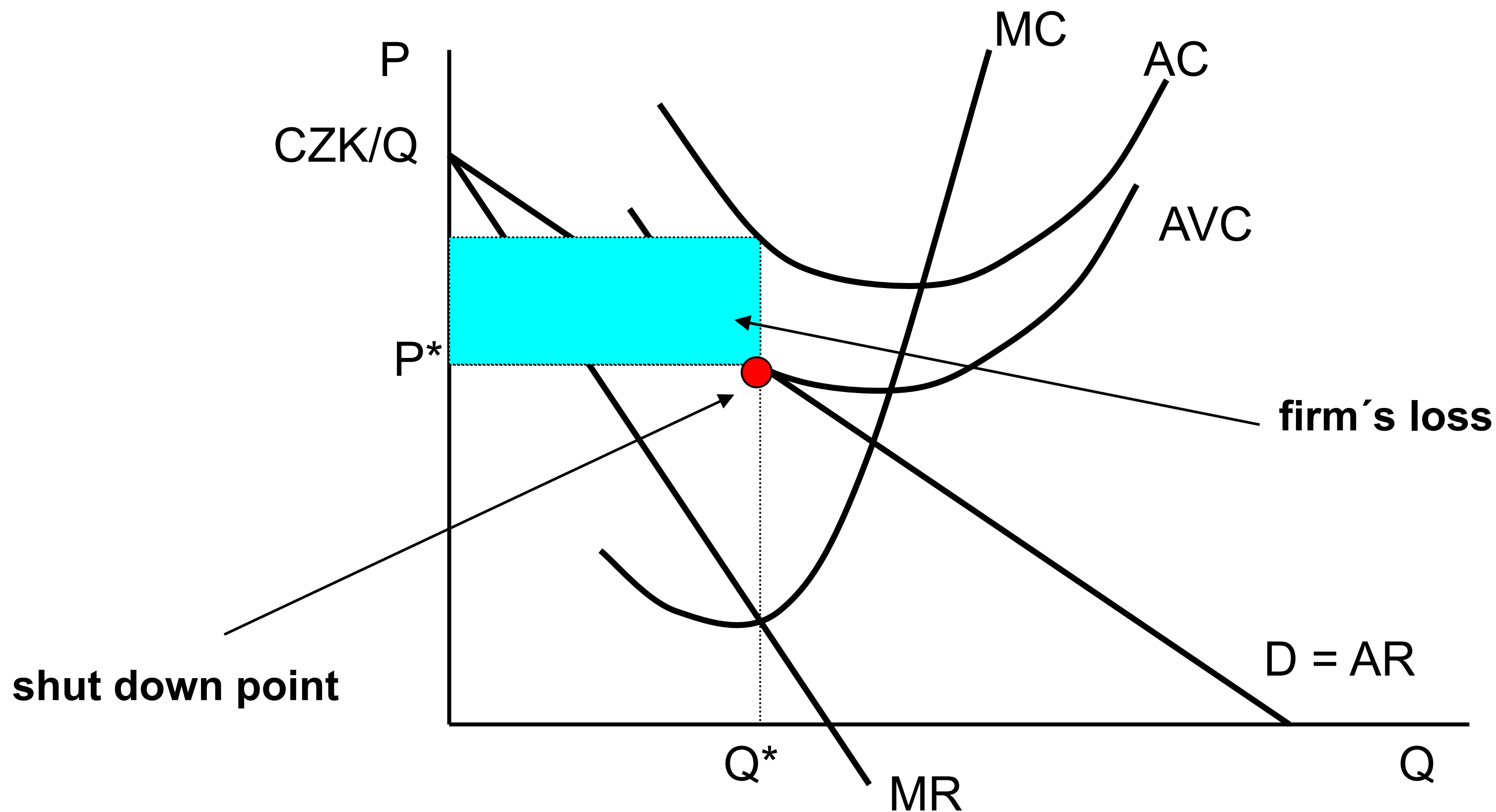


Monopolistic profit

- monopoly is able to gain a profit either in long run (entry restrictions)
- volume of profit/loss depends on the individual demand and firm´s costs
- if monopoly gains loss, the crucial criterion is the same as for the perfect competition firm (it also has to cover its VC in SR, or TC in LR)

Shut down point in SR

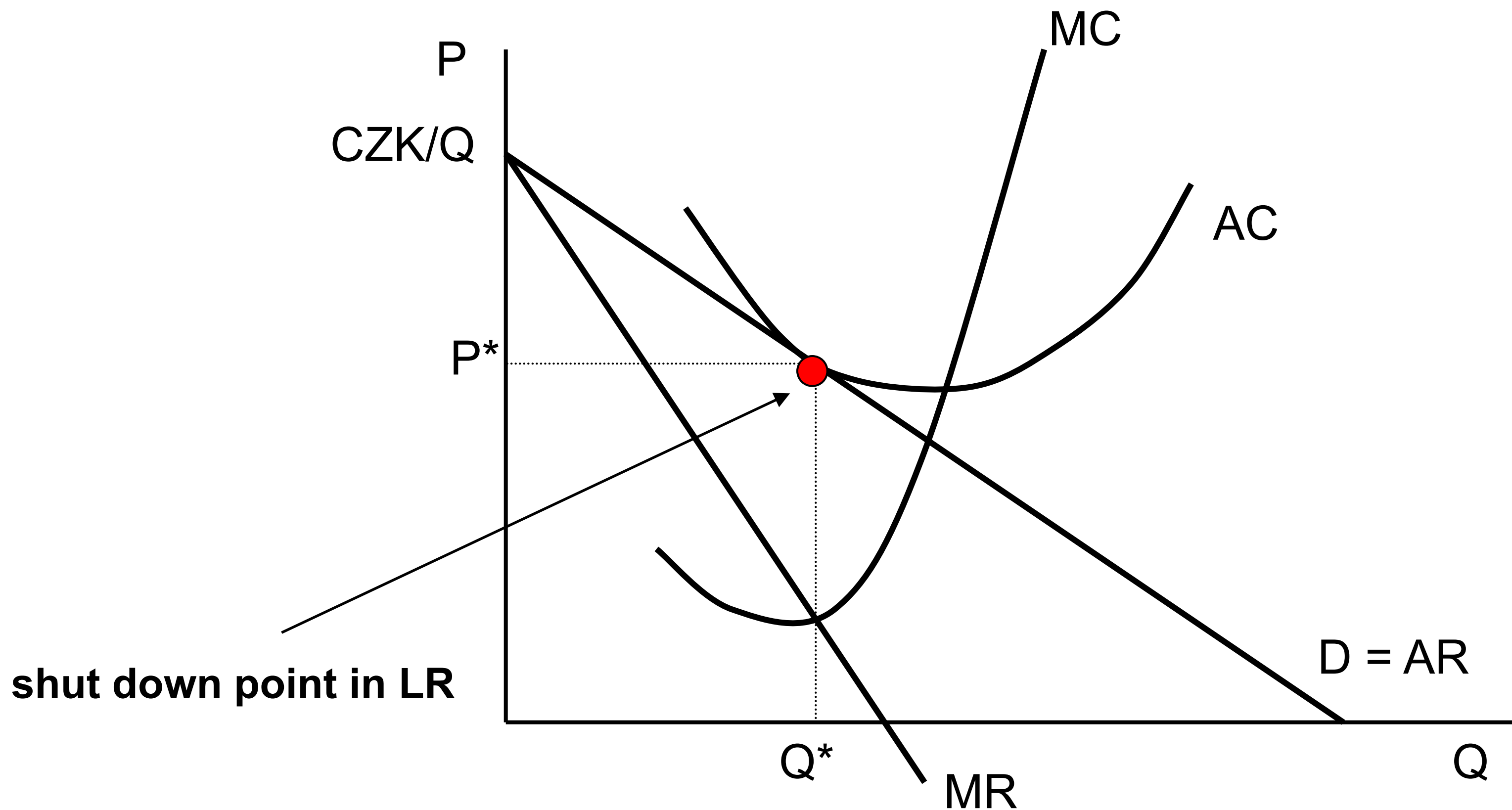
monopoly shuts down if: $P \leq AVC$



shut down point does not lie in the minimum of AVC – individual demand has a negative slope

Shut down point in LR

in LR the monopoly firm has to cover its total costs (at least) – monopoly shuts down if: P < AC



LR shut down point does not lie in the minimum of AC – individual demand has a negative slope

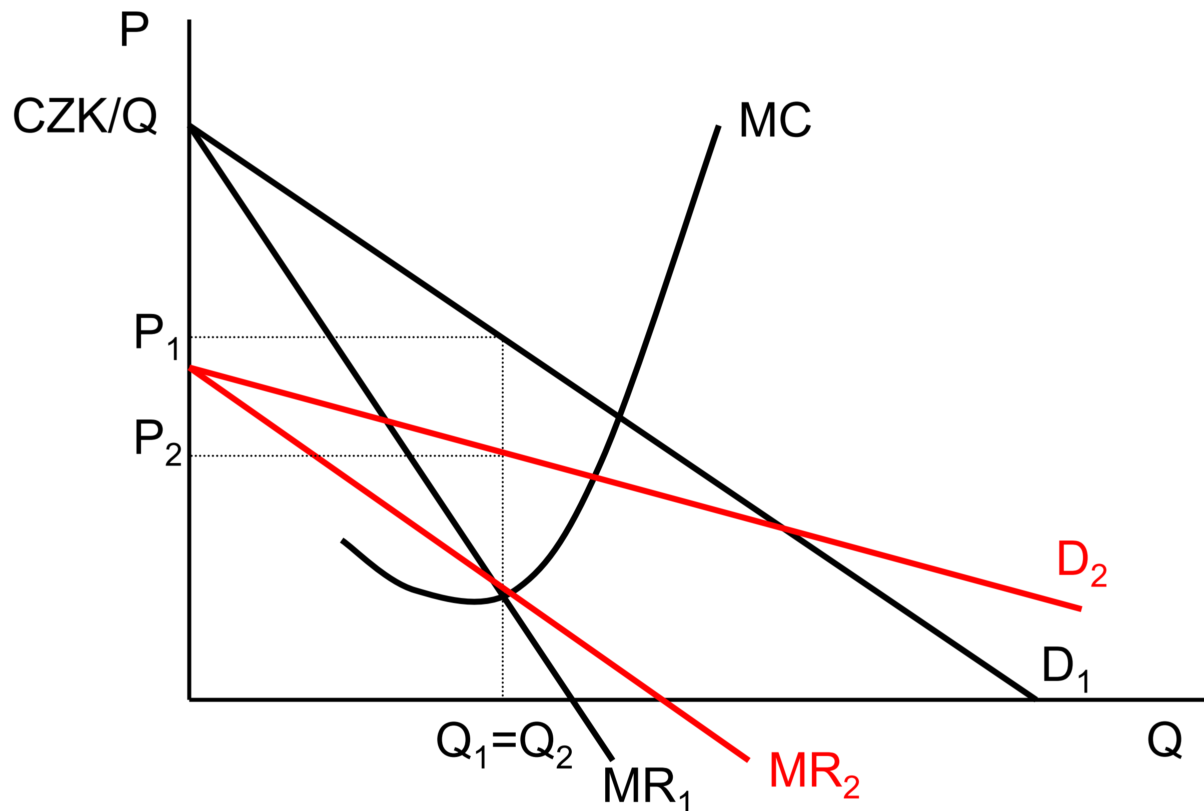
Monopoly supply curve

Monopoly supply curve is not possible to derive, because:

- spots of equilibria do not lie on the MC function
- we cannot acquire any set of spots which would represent a certain relationship between equilibrium price and output
- moreover – if the firm´s demand shifts: *there could be one equilibrium output for several equilibrium prices, or one equilibrium price for several equilibirum outputs*

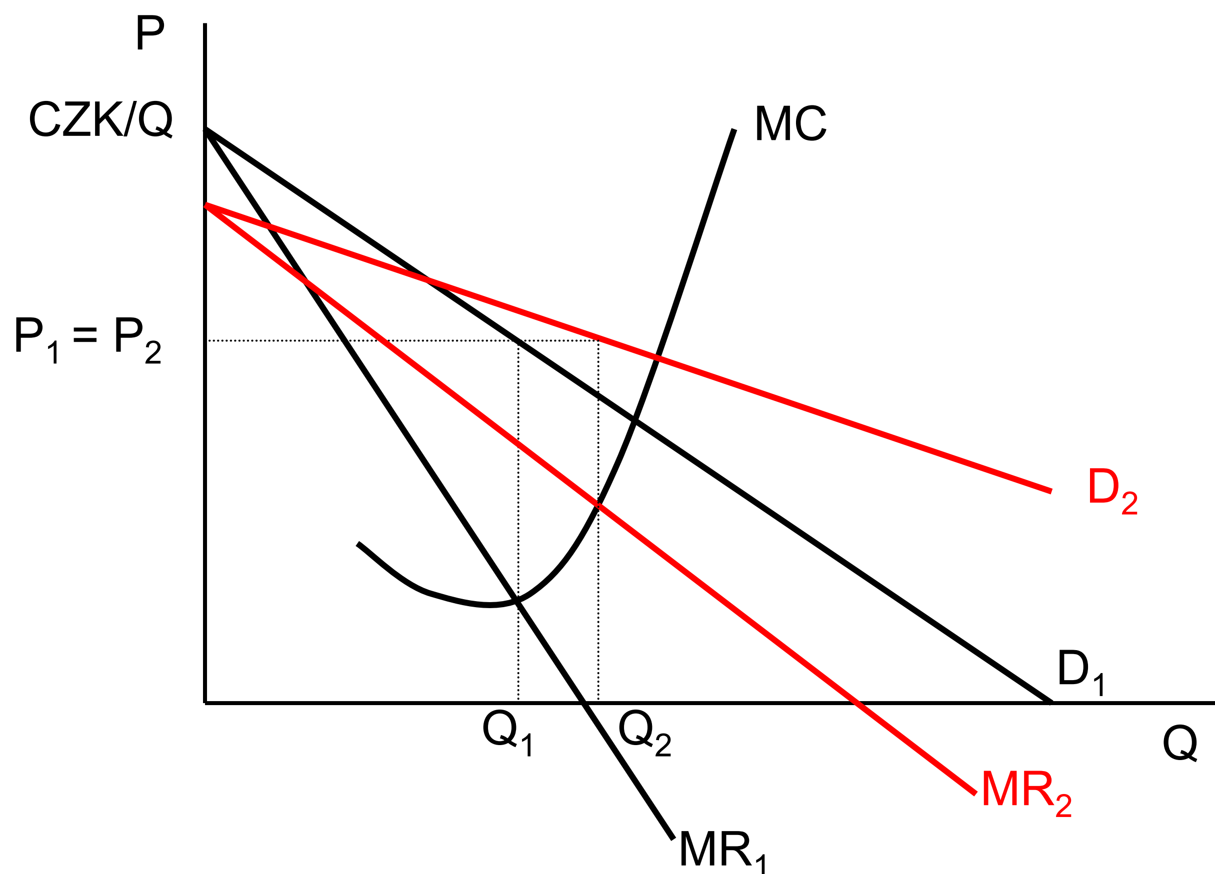
One output, two prices

the shift of individual demand could lead only to the shift of equilibrium prices (but not output)...

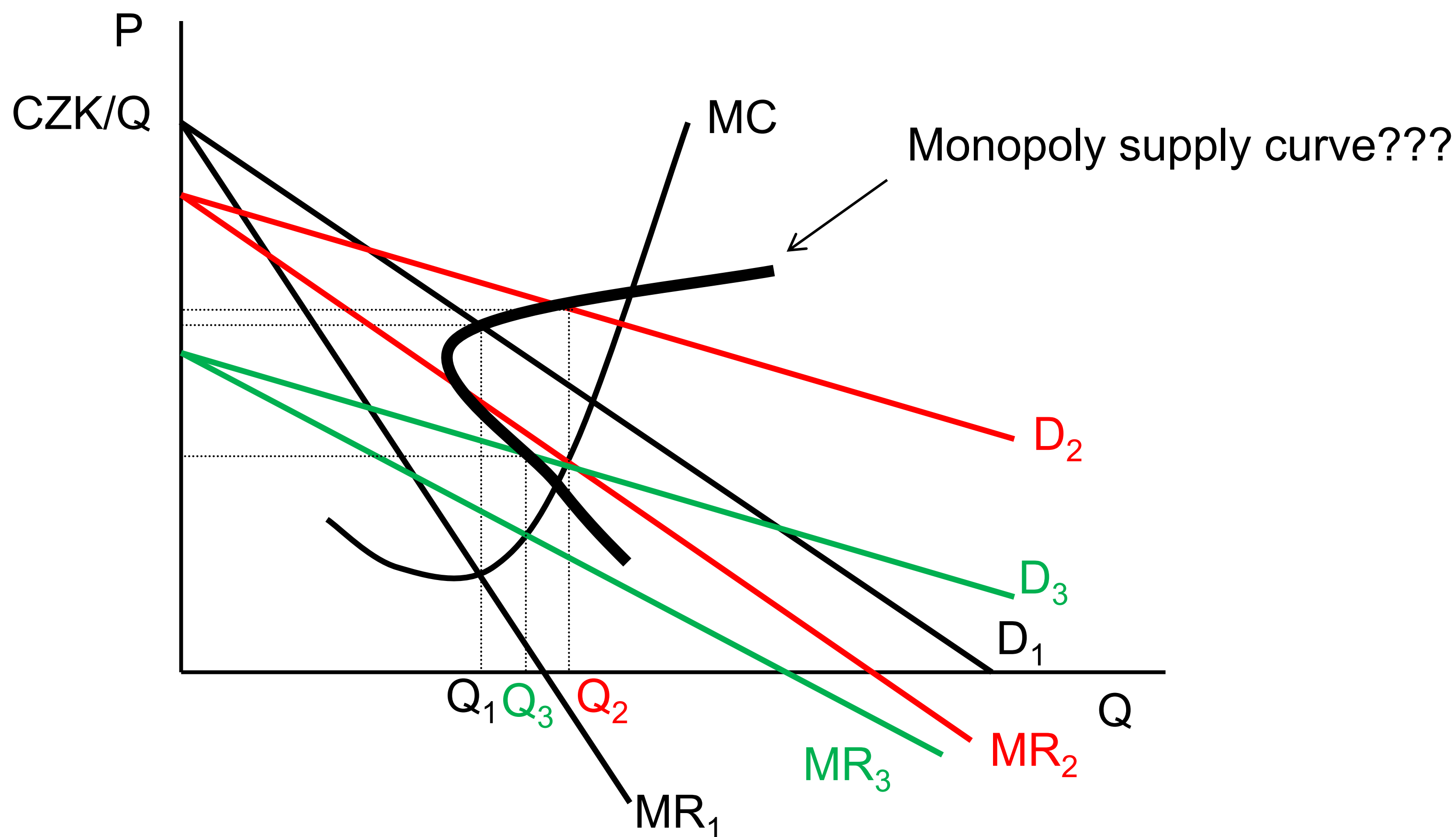


One price, two outputs

... or only to the shift of equilibrium output (but not price)



Multivalent relationship between equilibrium output and price



Setting the monopoly price

- monopoly cannot set its equilibrium price wherever it wants → must respect its individual demand
- equilibrium price lies above the monopoly MC
- the difference between MC and equilibrium price is determined by the price elasticity of demand
- the less elastic demand the higher difference between P and MC

The rule of reverse elasticity

$$MC = MR$$

for MR stands: $MR = \Delta TR / \Delta Q = P.\Delta Q + \Delta P.Q$

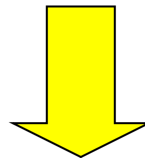
rearranging we get for MR:

$MR = P + (\Delta P/\Delta Q).Q = P.[1 + (Q.\Delta P/P.\Delta Q)]$, where:

$(Q.\Delta P/P.\Delta Q)] = 1/e_{PD}$, so:

$$MC = P.(1 + 1/e_{PD})$$

$$P = MC/(1 + 1/e_{PD})$$



if $e_{PD} = -3$, then P is 1,5 times higher than MC

if $e_{PD} = -15$, then P is 1,125 times higher than MC

Lerner index of firm´s market power

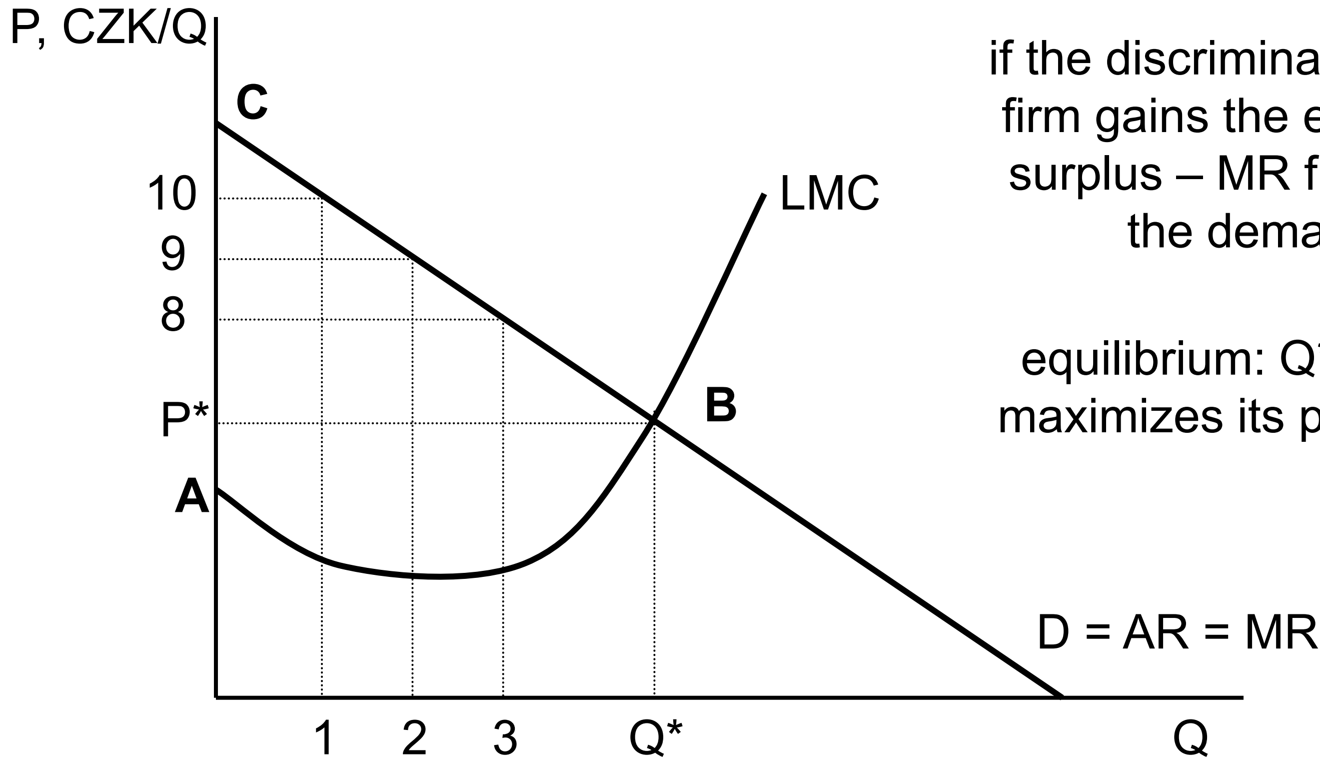
- measures the power to set the equilibrium price above the firm´s MC
- $L = (P - MC)/P$ $L \in \langle 0;1)$
- for perfect competition $L = 0$, because $P = MC$
- the higher value of Lerner index the higher firm´s power to set the equilibrium price above the MC

Price discrimination

- = different prices for identical good without „cost reasons“
- ... is a result of firm´s market power
- whatever imperfect competition firm is able to use price discrimination
- the aim: to capture part of (or entire) the consumer´s surplus, and to increase the firm´s profit
- several forms of price discrimination

First degree price discrimination

more or less only theoretical form – firm charges to each consumer the maximal price that he/she is willing to pay



if the discrimination is perfect, the firm gains the entire consumer´s surplus – MR function equals to the demand function

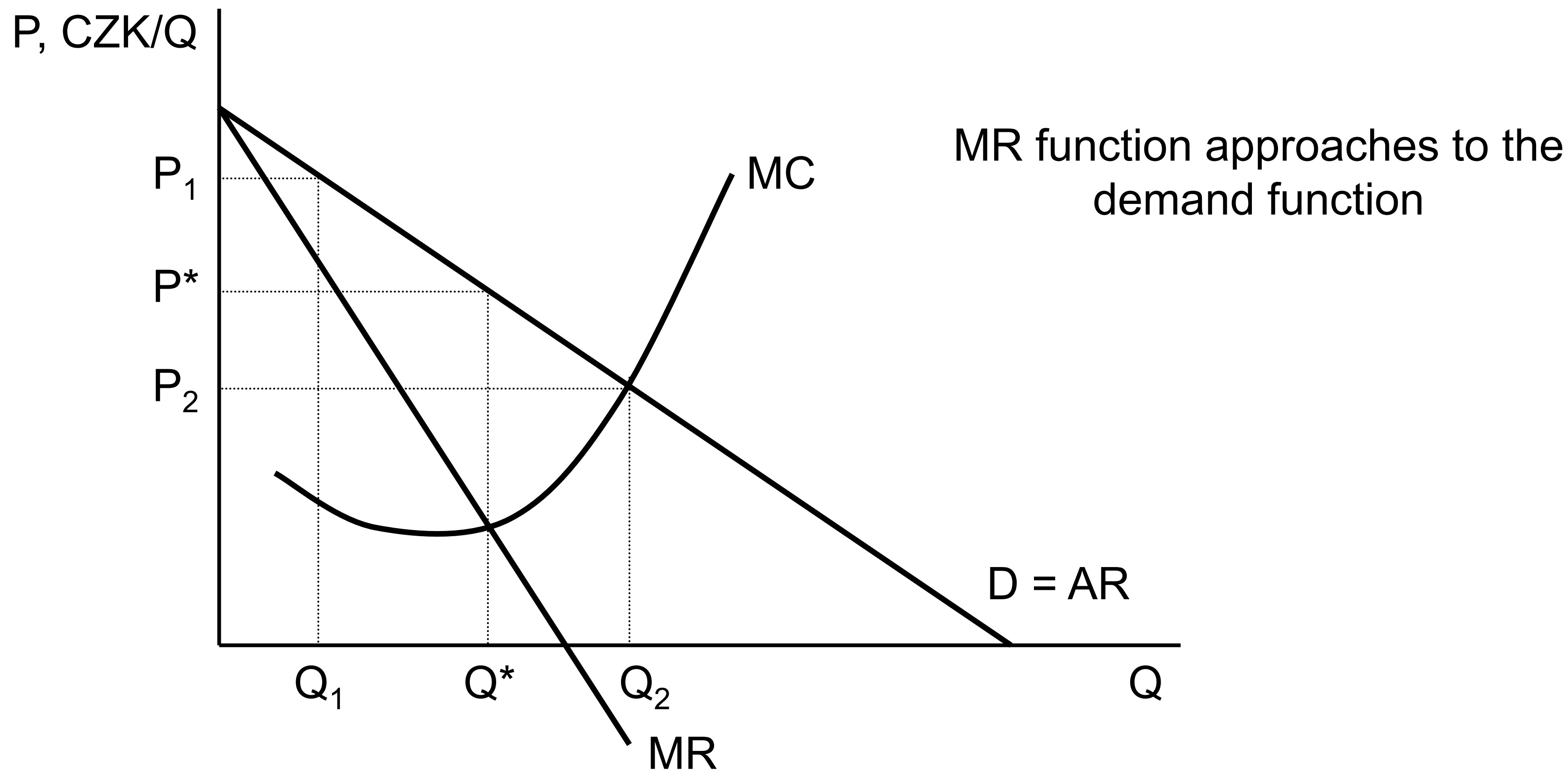
equilibrium: Q*, because firm maximizes its profit if MR = MC

monopoly profit equals to the surface ABC

first degree price discrimination leads to the allocative efficient equilibrium: DWL=0

Second degree price discrimination

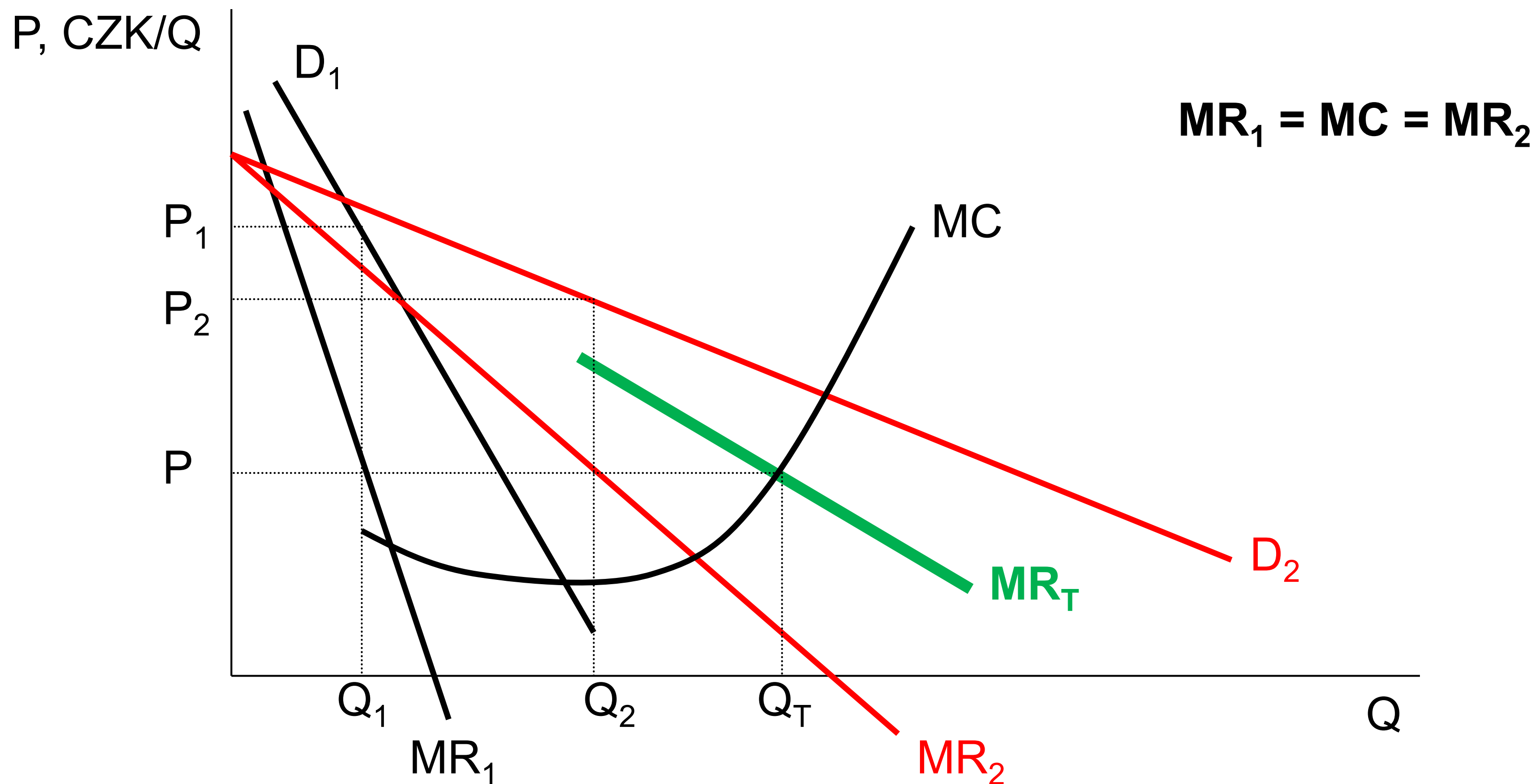
different prices for additional cumulative quantities sold – in fact: imperfect form of first degree price discrimination



monopoly captures only a part of the consumer´s surplus

Third degree price discrimination

price varies by the consumer segment – each segment has a different price elasticity of demand



less elastic demand represents ordinary consumers

more elastic demand represents i.e. students

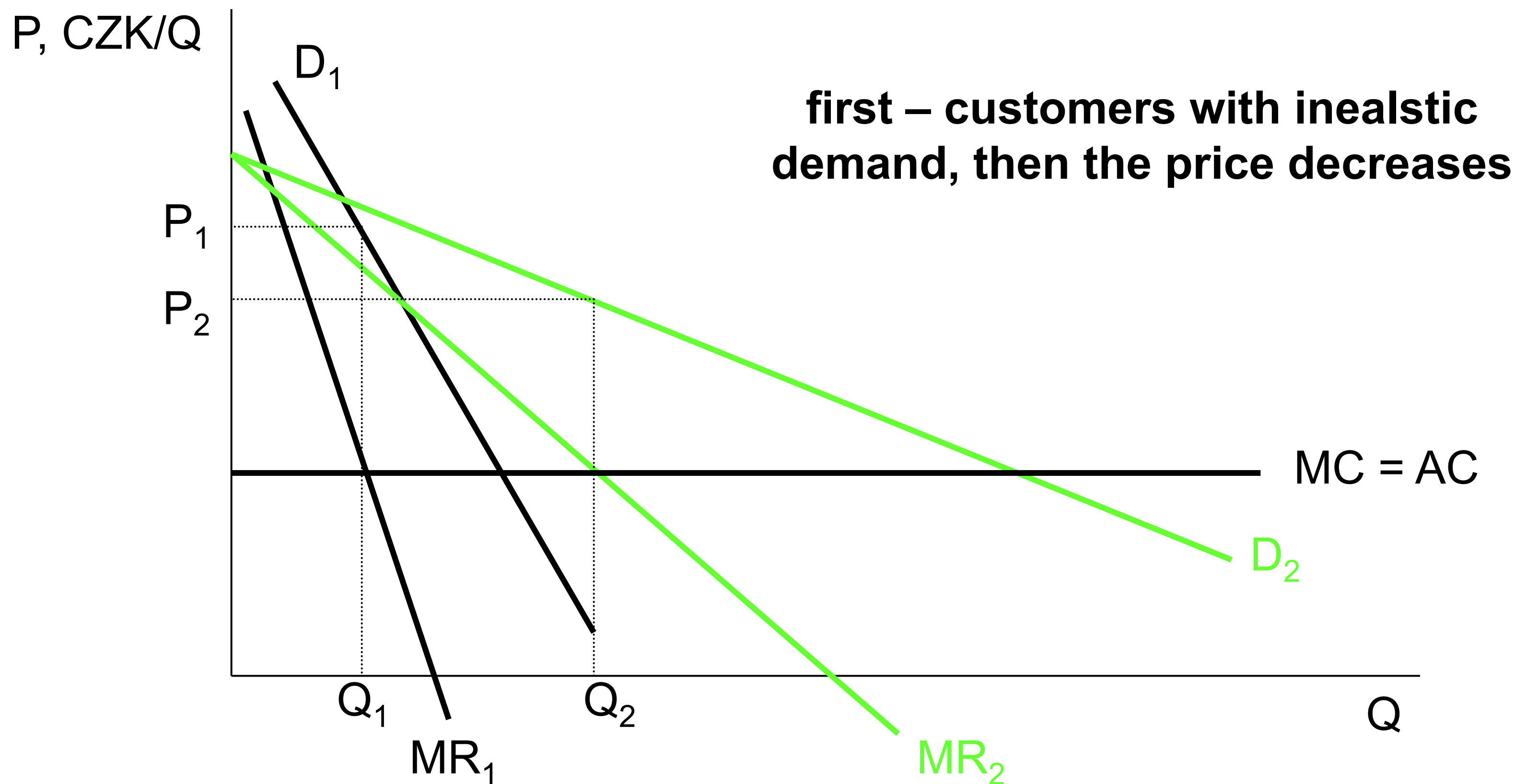
Third degree price discrimination

Works if:

- firm is able to divide the entire demand by a specific attribute to different segments - price elasticity
- consumers are disallowed to trade the goods among each other (i.e. registered flight tickets) or...
- ...transaction costs too high to be effective to trade the goods among consumers (i.e. shipping costs) – compare prices of brand goods in USA and Europe

Price skimming

new product is sold for the highest price in the beginning (i.e. new type of cell phone)

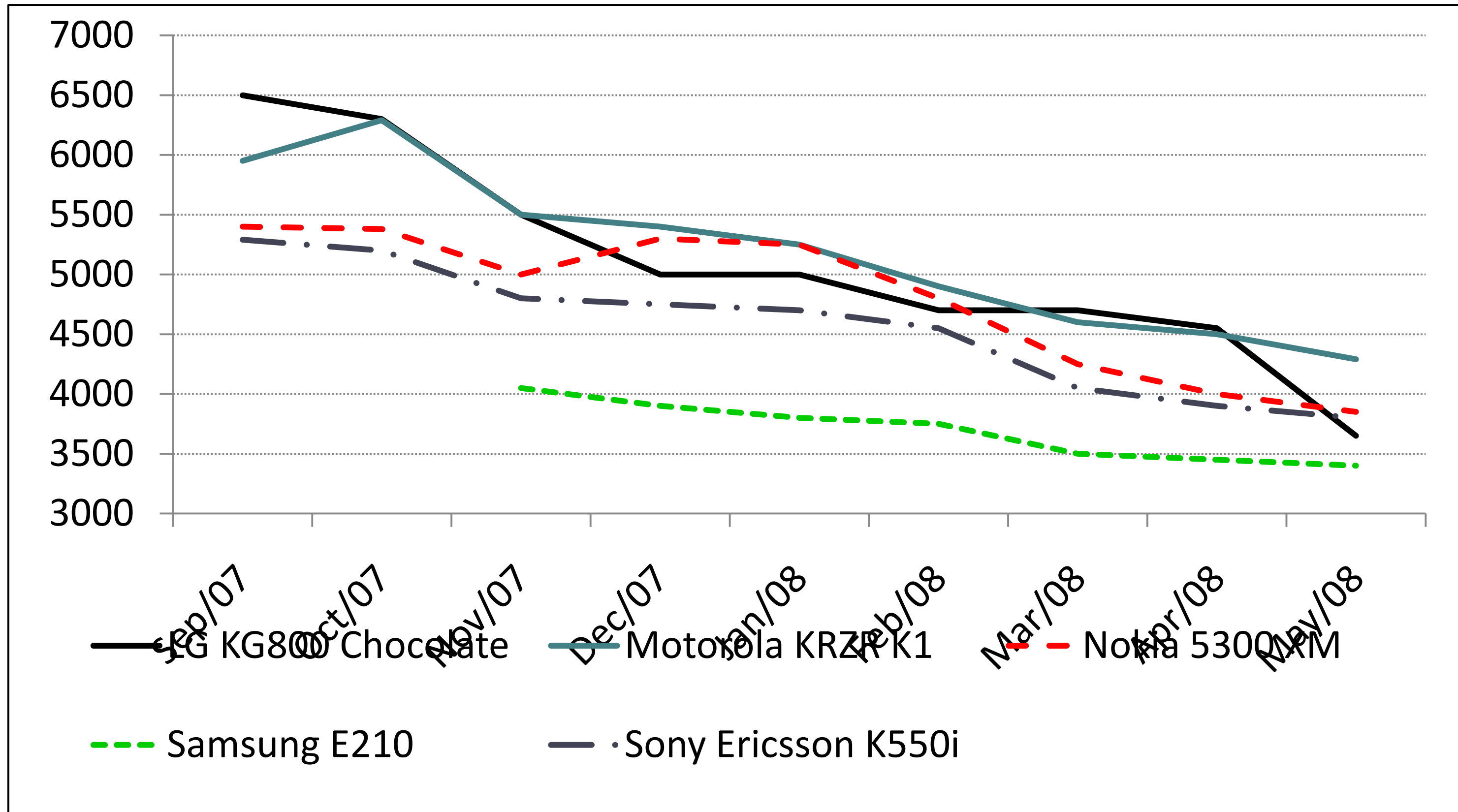


D_1 – those who want to buy the new cell phone „at any cost“

D_2 – those who don´t care to wait until the price decreases

Price skimming

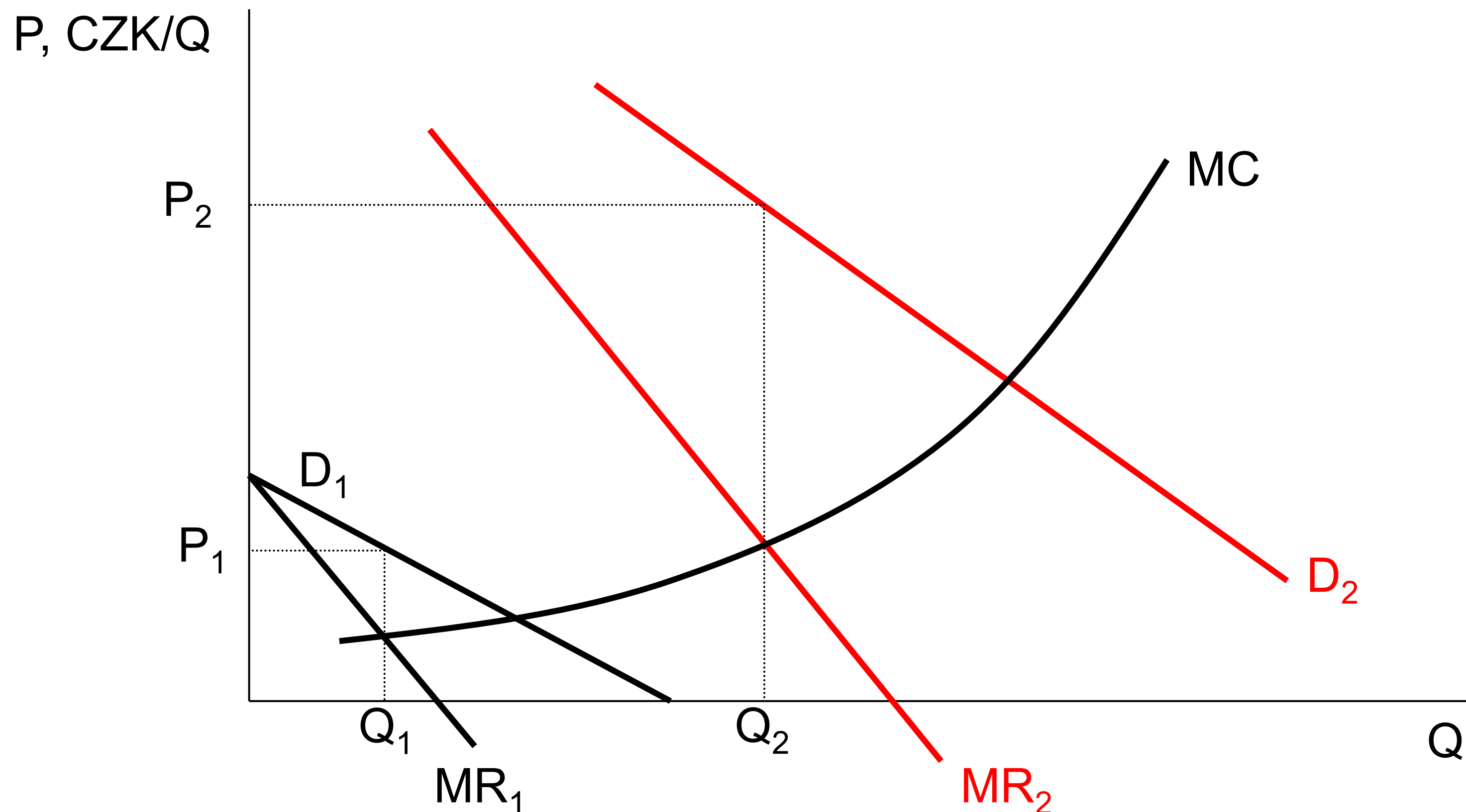
Prices of selected models of cell phones (Sept. 2007 – May 2008)



Source: www.mobilmania.cz

Peak and off-peak pricing

higher demand in peak hours usually leads to the higher equilibrium price



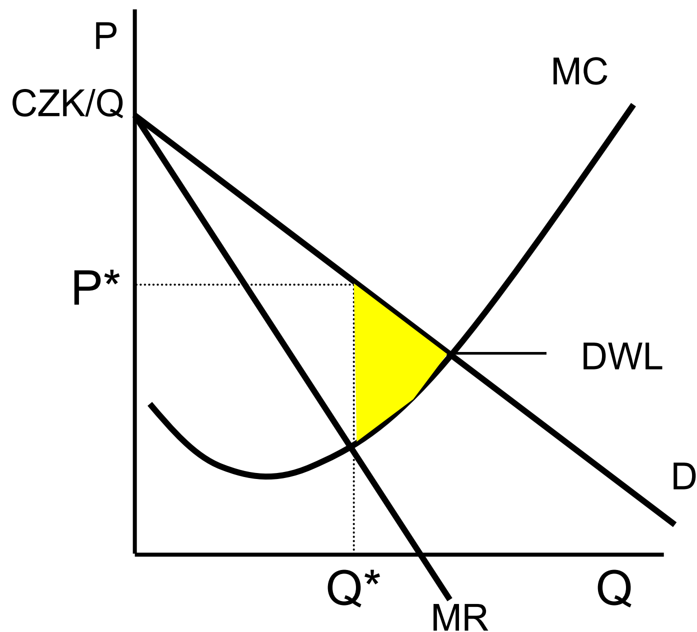
D_1 – i.e. demand for electricity in off-peak hours

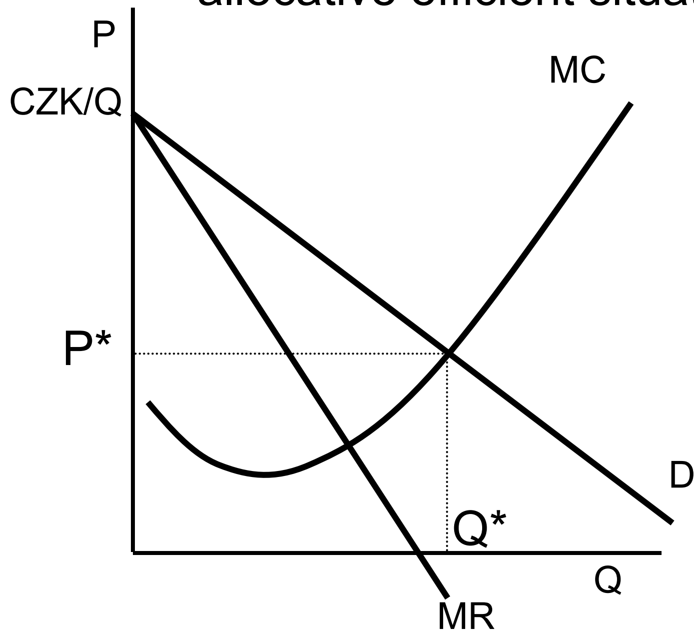
D_2 – i.e. demand for electricity in peak hours

Allocative and productive efficiency of monopoly

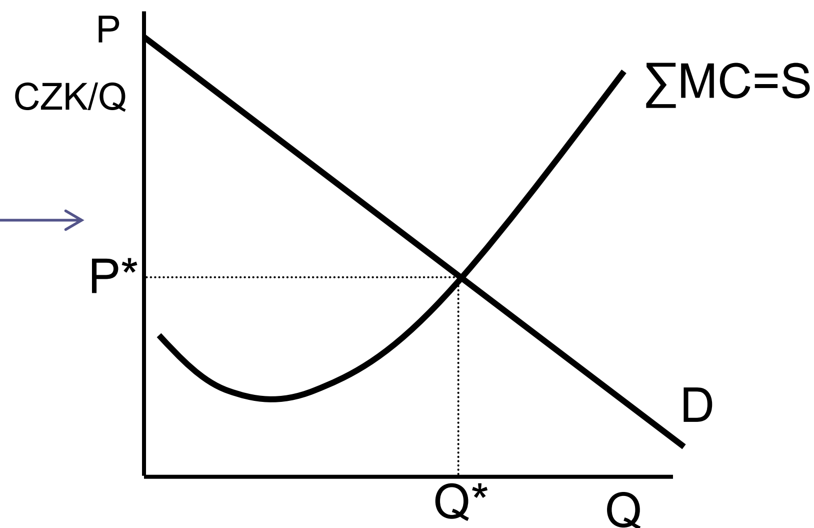
- monopoly is allocative and productive inefficient
- **Allocative efficiency** – existence of DWL – part of the consumers´ and producer´s surplus is lost – less quantity for higher price than upon perfect competition conditions
- **Productive efficiency** – monopoly does not minimize its AC on equilibrium output (neither in SR nor in LR)

Allocative efficiency





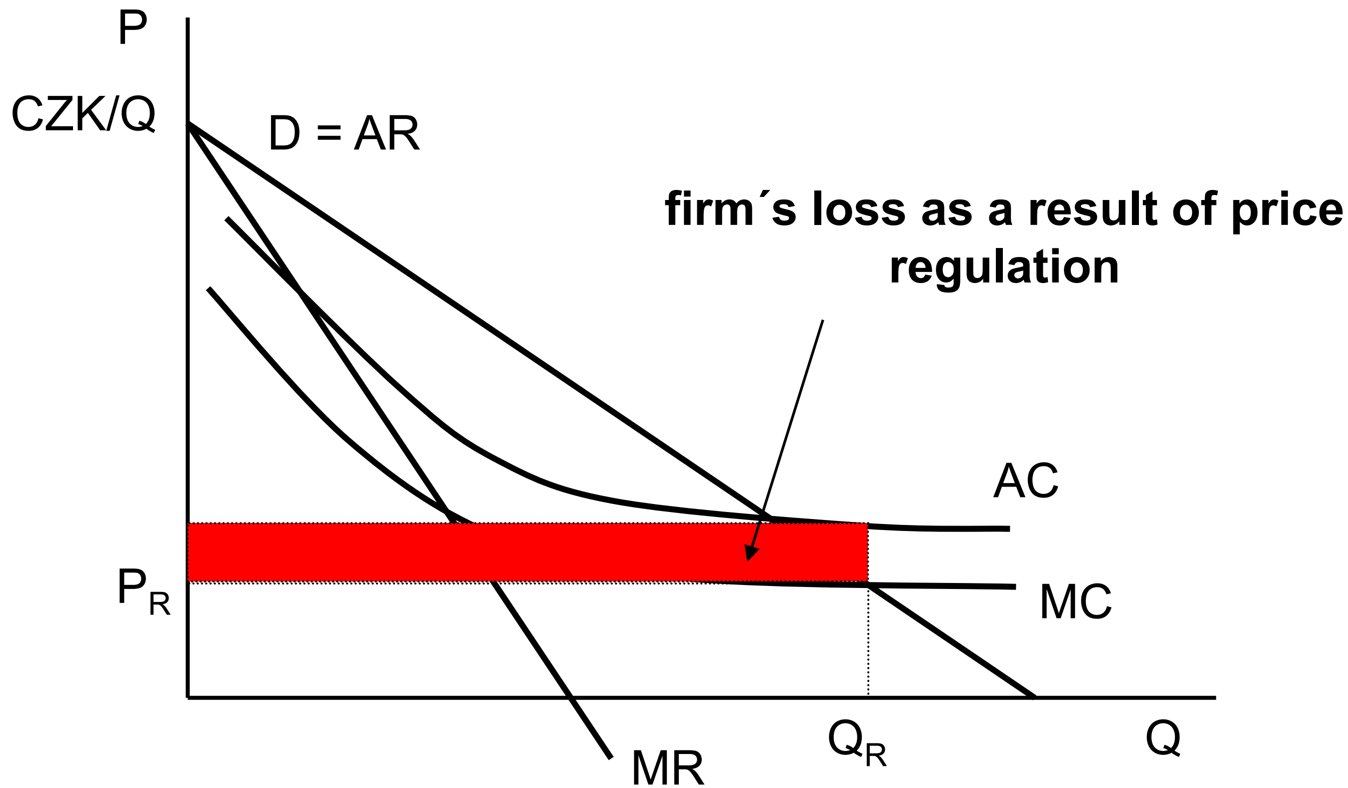
perfect
competition
market



Monopoly regulation

- usually price regulation – maximal prices
- the goal is to set the price to the level of firm´s MC to eliminate the DWL – state tries to apply perfect competition conditions
- problem:
  - a) how the state knows firm´s MC?
  - b) price at MC level can cause loss – natural monopoly
  - c) price regulation can cause the market imbalance (D > S)
- regulated price is the new function of MR

Elimination of DWL upon natural monopoly



Price regulation and demand overhang