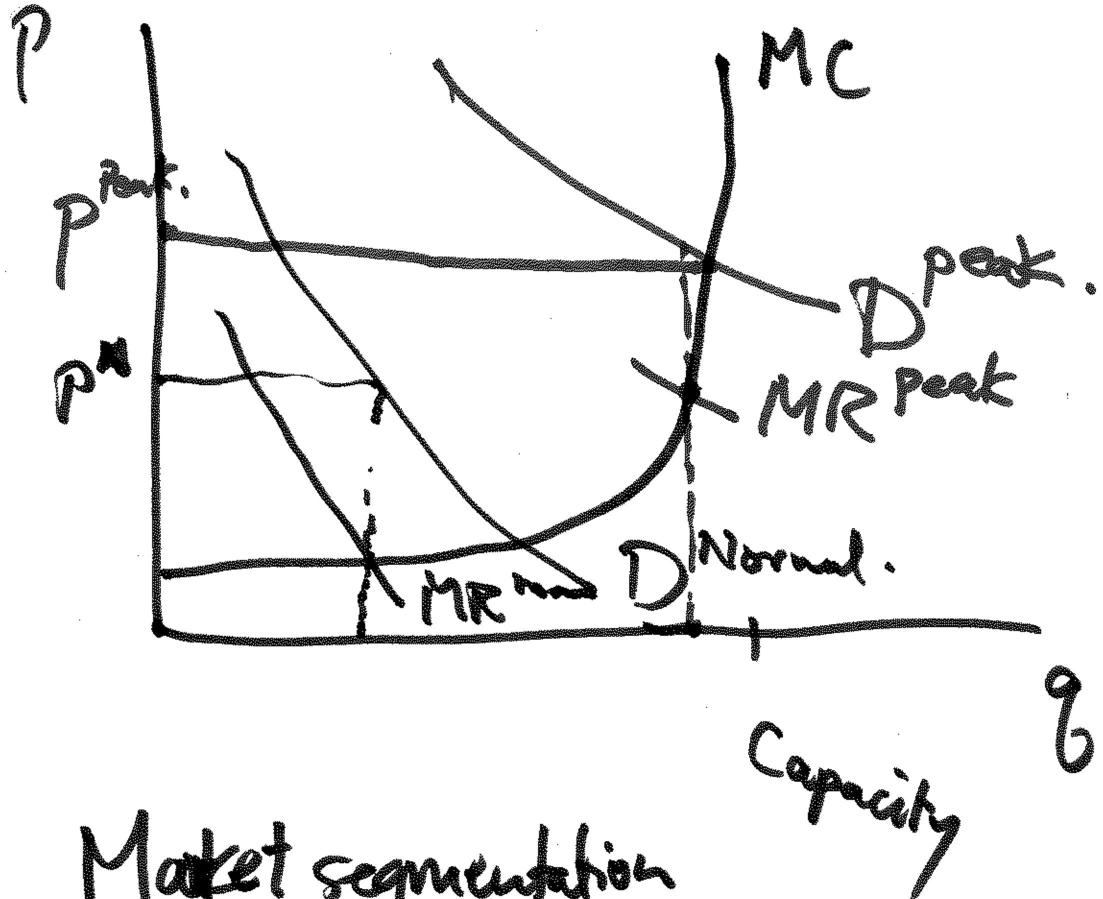
seats in stadium
electricity demand

Peak Load Pricing



Market segmentation
2° P. discrim +
~~cap/MC twist~~
with a twist: capacity constraints or at least MC that ~~varies~~ is much higher at peak demand.

"Not Undersold" policy = NUP
"We'll match any advertised price"
Good deal for consumers ?

Aero laptop sold by 2 firms:
Circus Sellers } $MC = \$800$
Freds } $P_{CS} = P_F = \$900$

$Q_{CS} = Q_F = 1000.$ $PS_i = \$1000 \cdot (900-800) = \$100K$

Scenario 1
Suppose Fred cuts price to \$860, doubles Q_F.
$PS_F \uparrow \$120K$. A real temptation!
eventually CS also cuts price, ...
"Bertrand hell"

Scenario 2 NUP. (Both firms)
A price cut to \$860 now will <u>not</u>
double Q_F! It's not a tempting proposition.
So both firms keep prices high & equal.

$\Rightarrow$ KDC model (Sweezy)
"sticky" prices
etc.

NUP dulls price competition.

Transfer Pricing

The internal price at which upstream division sells to downstream division

- for multinationals, use it to reduce taxes
- incentives for division managers —

Double marginalization problem

historical example:

$$\text{China} \underset{\text{gold}}{\overset{\text{silk}}{\rightleftarrows}} \text{Afghanistan} \underset{\text{gold}}{\overset{\text{silk}}{\rightleftarrows}} \text{Italy}$$

$\boxed{\text{price > monopoly}}$!

Simple contemporary example:

demand for final product

$$\boxed{P = 10 - 2Q}$$

$FC = 0$

$MC_{Total} = 2$, all upstream.

$$MC_{Total} = MC_U + MC_D, \quad MC_U = 2, \quad MC_D = 0$$

w/ no double marg. problem

$$MR = 10 - 4Q = MC = 2$$

$$\Rightarrow 4Q = 10 - 2 = 8$$

$$Q = \underline{2}$$

$$P = 10 - 2 \cdot 2 = \underline{6}$$

$$\pi = (P - MC)Q = 4 \cdot 2 = \underline{\underline{8}}.$$

Upstream ~~firm~~ division maximizes own profit:
it will price at 6 and hopes to sell 2 units

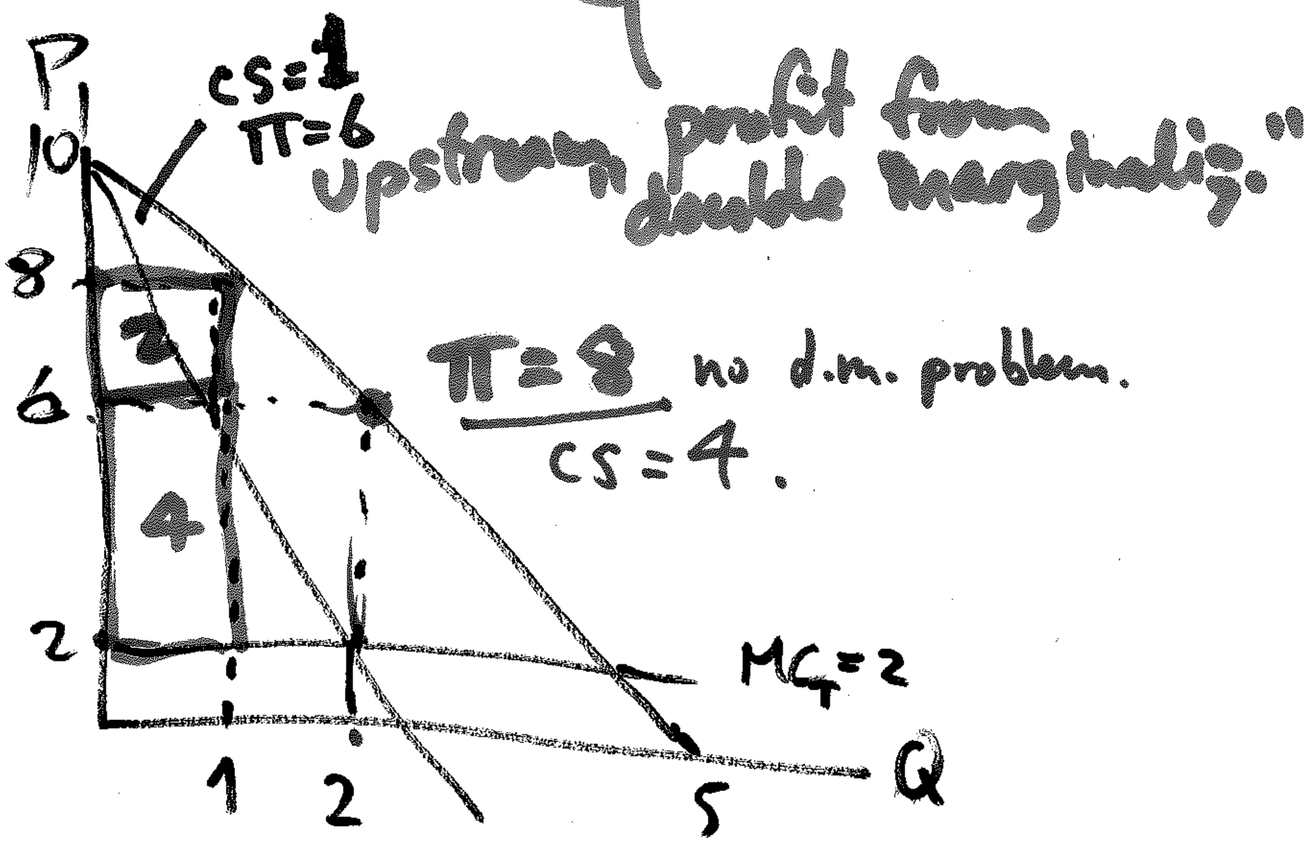
But if downstream firm takes this price as its own MC and max's profit:

$$\max \Pi_D = (P_D - 6)Q = (10 - 2Q - 6)Q = (4 - 2Q)Q.$$

FOC: $0 = 4 - 4Q \Rightarrow Q = 1$

$\Rightarrow P = 10 - 2 \cdot 1 = \underline{\underline{8}}$

& they get 2 in profit.



In general, when $MC_T = MC_U + MC_D$,
then firm as a whole sets

$$MR = MC_T = MC_U + MC_D$$

So motivate upstream firm by
~~set~~ setting

$$\underline{\underline{NMR}} \equiv \underline{MR} - MC_D = \underline{\underline{MC_U}} = P^{\underline{\text{transfer}}}.$$

transfer
price.

Basics of Risky Choice.

	x_i	p_i
i = Great	\$1000	0.10
i = So-So.	\$100	0.40
i = total loss	0	0.50

$$EX = \mu = (1000)(.1) + (100)(.4) + 0(.5) = \$140$$

$$Var = \sigma^2 = ((1000-140))^2(.1) + (100-140)^2(.4) + (0-140)^2(.5)$$
$$= \$84{,}400$$

$\sigma = \sqrt{\sigma^2} = \$290.$ standard deviation

(x_i, p_i), $i = 1, \dots, n$ $\quad \sum p_i = 1$, $p_i \geq 0$.

$$EX = \mu_x = \sum_{i=1}^{n} x_i p_i \ , \quad \sigma_x^2 = \sum_{i=1}^{n} (x_i - \mu)^2 p_i = Var X.$$

$$\sigma_x = \sqrt{\sigma_x^2} \ .$$

$x_1 = \$10$, $x_2 = 0$ $\quad \mu_x = \$5$
$p_1 = .5$, $p_2 = .5$ $\quad \sigma_x = \$5$

CE = valuation of the gamble
= \$5 for ~~almost~~ about 1/4 of class
$\geq$ \$4 for a ~~about 2/3~~ 1/2 of class. $\geq$ \$3 for most.
RP = μ - CE. > 0 if risk averse

Utility function

$$u_j(x) = CE_j = \mu_x - RP_j =$$
$$= \mu_x - r_j \sigma_x^2$$

risk ~~tolerance~~ aversion for person j.

e.g. if $RP_j = \$1$ & $CE_j = \$4$,

then risk ~~tolerance~~ aversion r_j satisfies

$$\boxed{CE = \mu_x - r_j \sigma_x^2}$$

$$4 = 5 - r_j \sigma^2$$

$$5-4 = 1 = r_j \sigma^2 = r_j 25$$

$$\Rightarrow \boxed{r_j = \frac{1}{25} = 0.04}$$

If $CE_j = 3$
then

$$3 = 5 - r_j \cdot 25 \Rightarrow r_j \cdot 25 = 5 - 3 = 2$$

$$r_j = 2/25 = .08$$