January 30.

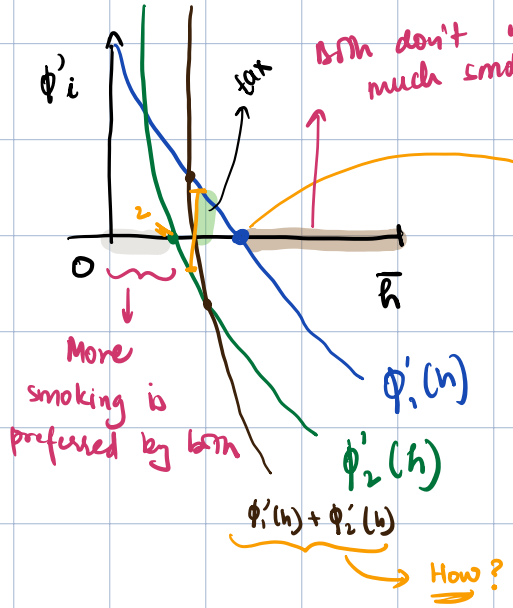
EXTERNALITIES

So far philosophical case for markets:

$$u_i = \tilde{\phi}_i(x_i) + \underbrace{m_i}_{\downarrow\ M_i - px_i} = \phi_i(x_i) + M_i$$

where $\phi_i(x_i) = \hat{\phi}_i - p_i x_i$

$$\phi_i'(x_i) = 0$$



* Ind 1 Consume cigars until here $MD = 0$

* 2 Ind 2 would prefer Ind 1 consume cigars until this point.

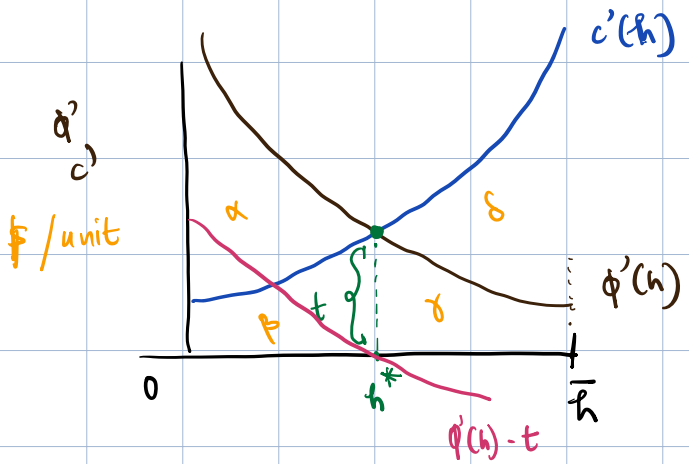
Individual 1 producing

2 suffering from it

Individual 2 likes small qty of cigars but not much.

* Pigou(vian) Taxation : $t > 0$

(Draw the subsidy version of it).



consume h as much as she is able to do.

φ' →

Social Max. Problem $\phi(h) - c(h)$

FOC: $\phi'(h^*) = c'(h^*)$

Original CS to cons 1 = $\alpha + \beta + \gamma$ | Original CS to cons 2 = $\beta + \gamma + \delta$

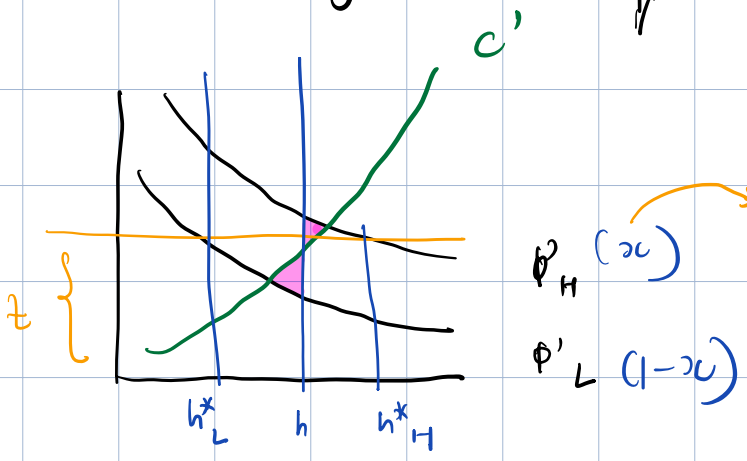
Social welfare: $\alpha - \delta$

New social welfare = α (Add why this is so).

* Weitzman.

Is tax better or quota

Q) How to optimally set the quota?



→ probability of H scenario.

Weitzman.

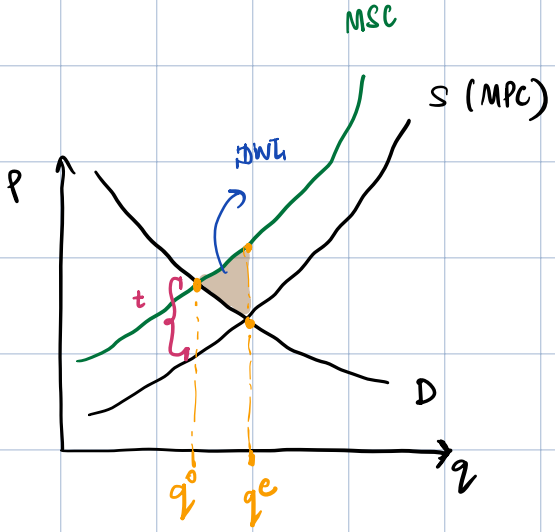
$$\max_{\hat{h}} S = x\phi_H(\hat{h}) + (1-x)\phi_L(\hat{h}) - c(\hat{h})$$

$$x\phi'_H + (1-x)\phi'_L = c'$$

$$x(\phi'_H - c') = -(1-x)(\phi'_L - c')$$

you equate the probability weighted marginal dwl

Class II

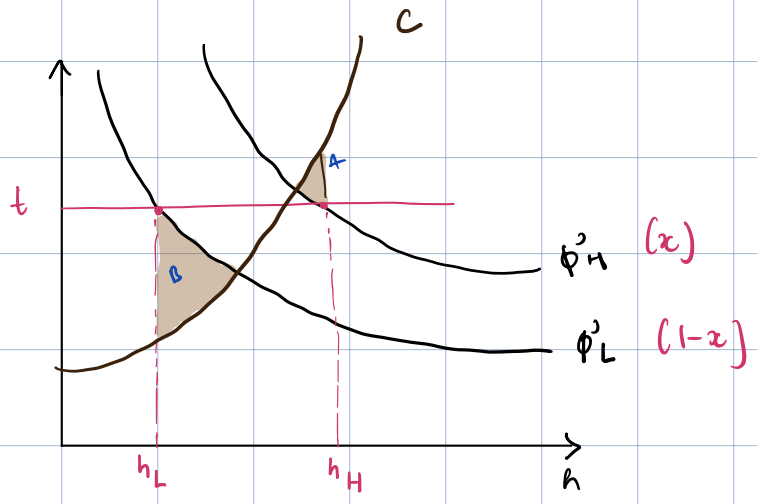


- MPC: Marginal Pvt. cost
- MSC: Marginal Social Cost

DWL from overproduction

- These are Aggregate demand & Aggregate supply curves.

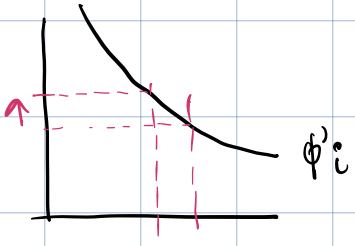
* Getting back to quotas / taxes :—

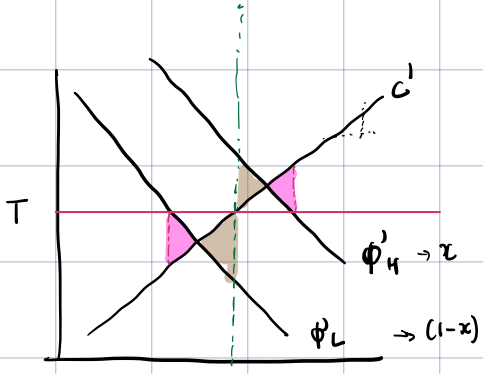


- A & B are DWLs.
- By changing t, you can inc A & reduce B or vice versa.
- Equate probability weighted Marginal DWL.

* Taxes are only returned to the public $ for $.

* Lagrangian (in the handout)

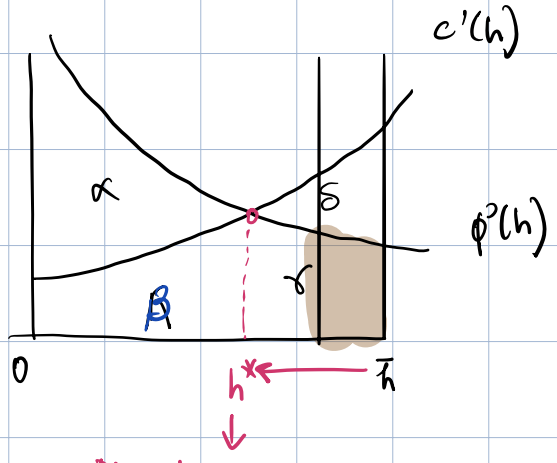




ϕ'_H & ϕ'_L are parallel, same probability
⇒ quota in the middle

The flatter the MC, taxation is the optimal

* Coase Theorem.



* Pt. of mutually advantageous trade

* They both know pvt Marginal benefit curves

* Govt. sets the property rights.

* Absence of transaction costs

Property Right

PR $\bar{h}$ take it or leave it by 1

$\max \ \phi(h) + T$

T?: $M_2 - c(\bar{h}) \leq M_2 - T - c(h)$

$$\mathcal{L} = \phi(h) + T - \lambda(\underbrace{\phi(h) + T - c(\bar{h})}_{=0})$$

$\lambda = 1$

$\phi' = c' \Rightarrow h^*$

$T = \gamma + \delta$

* Do alternative case when property right is with the sufferer. / take it or leave it offer by (2).

* Remember minimization

$$\min \; c(h) + T \quad \text{s.t.} \quad \phi(\bar{h}) \leq \phi(h) + T$$

$$\mathcal{L} = c(h) + T + \lambda(\phi(\bar{h}) - \phi(h) - T)$$

$$\lambda = 1$$

$$\phi' = c' \Rightarrow h^*$$

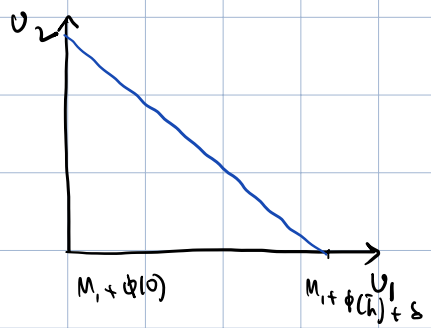
(*) We get to the same place.

If ~~pro~~ govt mandates at 0, the social surplus at grabs $= \alpha + \beta$

Feb 1,

Utility Possibility Frontier

$\phi'(h^*) = c'(h^*)$ (How is this not a single point)



* Nash Bargaining

(In the slides) (SLOW DOWN !!)

* Fish cleaning & beer.

let $\pi_f(h) = \phi(h)$

$\pi_b(h) = \bar{\pi}_b - c(h)$

Take-over price max $\alpha + \beta + \gamma + \delta$

↳ what trade is voluntary

Missing market Interpretation.

* Card Games

$(p-c)\underbrace{Pr(b>p)}_{1-F(p)}$

Uniform Distn → What is $(1-p)$

$(p-c)(1-p)$ → arg max.

$p = \frac{1+c}{2}$

eg: $c = 6$

$p = 10$; $\pi = 4.3$

$p = 9$; $\pi = 3.4$

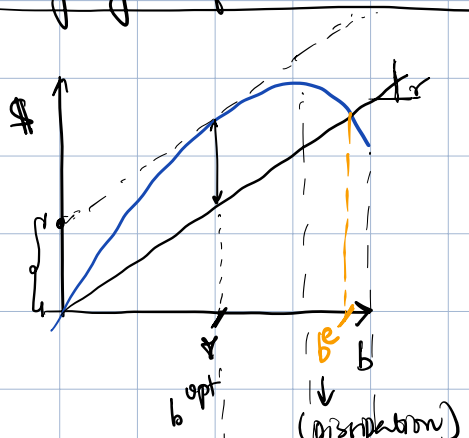
Black → Benefit ($\hat{b}$) | Red → Cost. ($\hat{c}$)

Class F

- Nash Equilibrium: Handout.

Vickrey - Groves - Clark - Ledyard

- Tragedy of the commons.



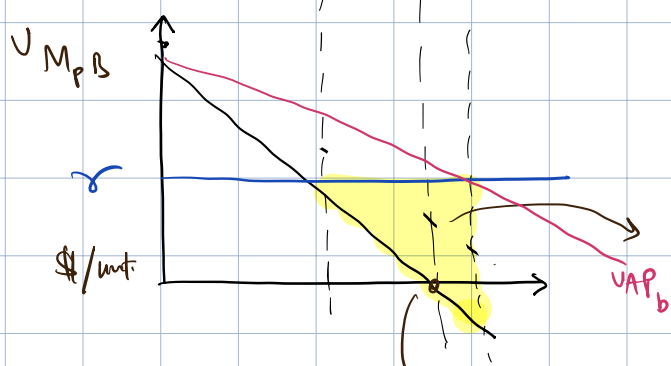
$P_f f(b)$ prod^n function of fishing

$-rb$ Total cost spent fishing

* Economic Maximum.

Max $P_f f(b) - rb$

$\Rightarrow$ $P_f' f(b) = r$



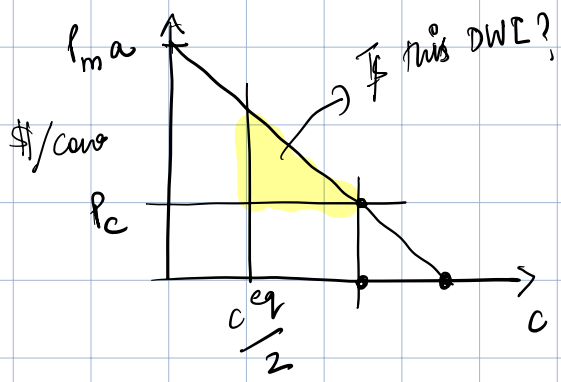
what is this?

0 = when $P_f f(b)$ is at max.

meat/cow

* $M = a - bc$ cows.

$P_m M - P_c = 0$



$$P_m(a-bc) = P_{cap}$$

$$\left(a - \frac{P_c}{P_m}\right)\frac{1}{b} = c^{eq}$$

* Traffic congestion (Transport Economics)

marginal private cost.

$40 MPC → 6000 people → $10/hr

slowed down by $\frac{10}{n}$

1 min

1 hr → $10

60 min →

1 min → $\frac{10}{60}$

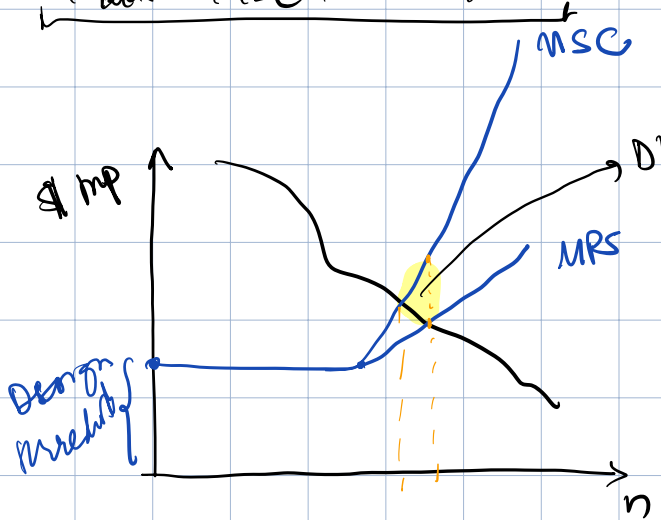
$\left(\frac{10}{60}\right)6000$

1000

+ 40

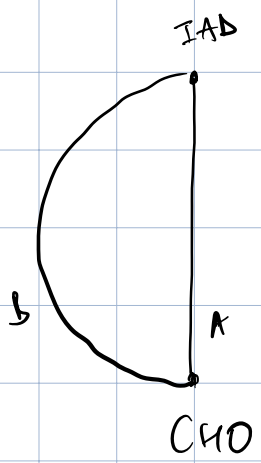
1040

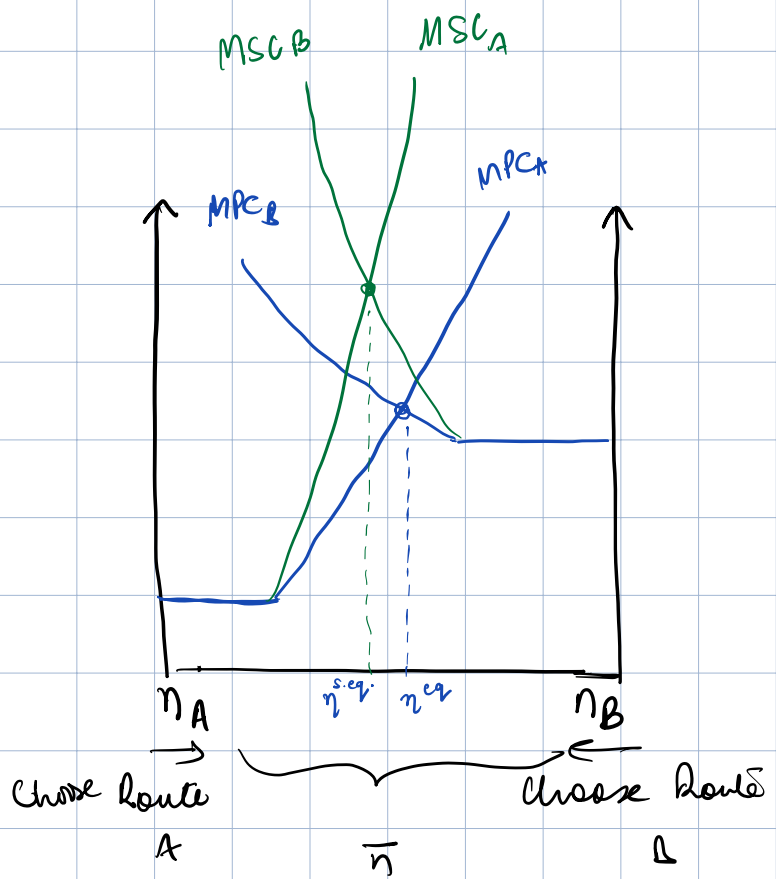
Total MSC = 1040



② $\bar{n}$: want to travel

$$n_A + n_B = \bar{n}$$





Auctions — Vickrey; 2nd Price Auction (VCG)

→ My payments depend on other people's values

[Facebook is using VCG auction for selling advts.]

* English, Ascending bid: Bid your own value.

* CONGESTION

Rush Hour: Tariff time specific. Higher tariff at rush hours.

Tariff for externality cost

What time of the day should I go?