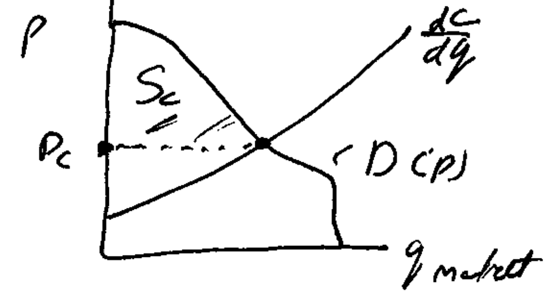


Two Part Tariff

$T(q) = pq$ (linear)

$T(q) = A + pq$ (affine, two-part tariff)

If all consumers are identical, and total consumer surplus is $S^c = \int_0^{q_c} (P(q) - p^c)\, dq$ at P_c, comp. price, then each consumer has $CS_i = \frac{S^c}{n}$.

The optimal 2PT is

$$T(q) = \begin{cases} p_c q + \frac{S_c}{n} & \text{if } q > 0 \\ 0 & \text{if } q = 0. \end{cases}$$

Alternatively, charge

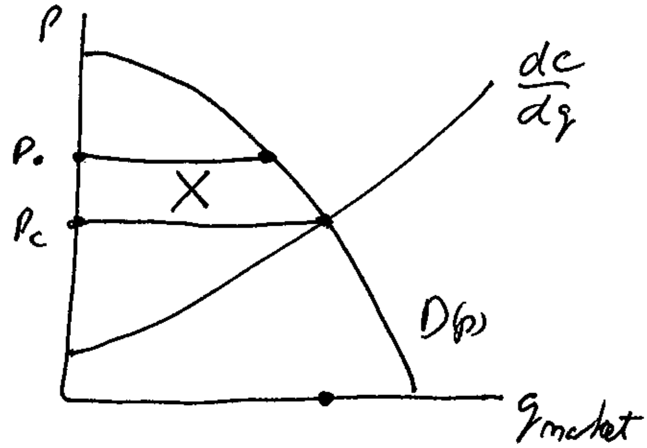
$$T = \begin{cases} P_c q + \frac{S_c}{n} & \text{if } q = \frac{q_c}{n} \\ 0 & \text{if } q = 0 \\ \text{don't sell} & \text{if } q = \text{anything else.} \end{cases}$$

Why use a 2PT, then?

- if there are different types of consumers, it can help as interquantity PD, with per-unit price above MC.

Two-part-tariff with a fringe

p.136



$$T = \begin{cases} P_c q + \frac{X}{n} & \text{if } q>0 \\ 0 & \text{if } q=0 \end{cases}$$

Interbuyer PD (Multimarket)

– choose P. Maybe heterogeneous consumers in each market.

$$\varepsilon^d = \frac{-\%\Delta Q}{\%\Delta P} = \frac{-\Delta Q/Q}{\Delta P/P} = \frac{-P}{Q}\cdot\frac{dQ}{dP}.$$

$$q = \sum D_i(P_i)$$

$$\max_{P_i} \pi = \sum P_i D_i - C\left(\sum D_i\right)$$

$$\rightarrow \quad \frac{d\pi}{dP_i} = D_i + P_i \frac{dD_i}{dP_i} - \frac{dC}{dq}\cdot\frac{dq}{dD_i}\cdot\frac{dD_i}{dP_i} = 0$$

$$\frac{D}{D'} + P - C' = 0$$

$$\frac{P-c'}{P} = \frac{-D}{D'P} = -\frac{D}{P}\cdot\frac{1}{\frac{dD}{dP}} = \frac{-1}{\frac{D}{P}\cdot\frac{dD}{dP}}$$

$$= -1/\varepsilon$$

This is the Ramsey rule, for revenue equal to the monopoly revenue Lerner Index $= \frac{P_i - c'}{P_i}$.

$$\frac{p_i - c'}{p_i} = \frac{1}{\varepsilon}.$$

Example:

$C' = 10$ $\qquad \dfrac{P_1 - 10}{P_1} = \dfrac{1}{2} \rightarrow P_1 = 15$

$\varepsilon_1 = 2$

$\varepsilon_2 = 3$ $\qquad \dfrac{P_2 - 10}{P_2} = \dfrac{1}{3} \rightarrow P_2 =$

"Charge more in markets with lower elasticity."

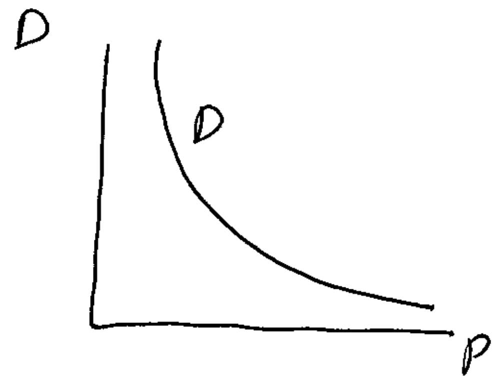
Meaning?

For constant elasticity, easy, as above. This happens if

$$D = p^{-\alpha}$$

$$\frac{dD}{dp} = -\alpha p^{-\alpha-1} = \frac{-\alpha D}{p}$$

$$\varepsilon = -\frac{p}{D} \cdot \frac{dD}{dp} = \left(\frac{p}{D}\right)\left(\frac{-\alpha D}{p}\right) = -\alpha.$$

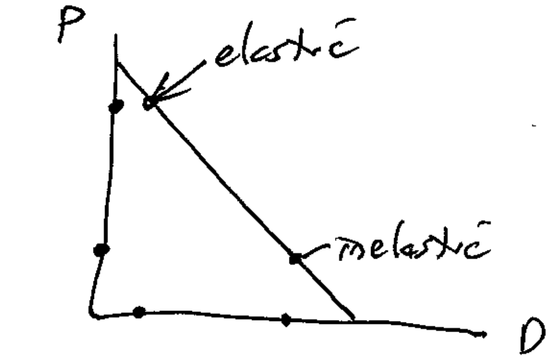


What if $\varepsilon_i < 1$? (inelastic) Try $\varepsilon_i = .5$

$\rightarrow P_i = \infty, \qquad \dfrac{P_1 - 10}{P_1} = \dfrac{1}{.5} = 2$

But $\displaystyle\lim_{P_1 \to \infty} \frac{P_1 - 10}{P_1} = 1.$ Corner Solution!

What if Elasticity Varies?



$$\varepsilon = \frac{P}{D} \cdot \underset{\uparrow \atop \text{constant}}{\frac{dD}{dP}}$$

We can't say one buyer is more elastic than another, in general

But if $P_1 = P_2$, it might well be that $\varepsilon_1 \neq \varepsilon_2$.

So think about starting with identical prices.
You can profit by lowering the price in the more elastic market, raising it the less elastic.

Raise 10% in less elastic, lose 5% in sales
~~Raise~~ Reduce 10% in more elastic, gain 8% in sales.

the idea, very loose.

PD and Welfare

The good thing about PD is it ~~[illegible]~~ can lessen the monopoly restriction of output.

Bad thing: It distorts how any given Q is distributed among consumers.

For efficiency, we need the Marginal rate of substitution the same for all consumers.

If Joe values his last unit at $10 and Mary values hers at $15, that is inefficient.

We could move that unit from Mary to Joe and raise welfare,

Perfect PD

This ~~[illegible]~~ raises welfare. Output ~~[illegible]~~ is at the 1st-best level.

Caveat: Rent-seeking. Sellers may compete to ~~get the~~ become the monopolist, and eat up all the rents. (Posner 1976)

Remember the War of Attrition. Each firm's expected payoff equals zero.

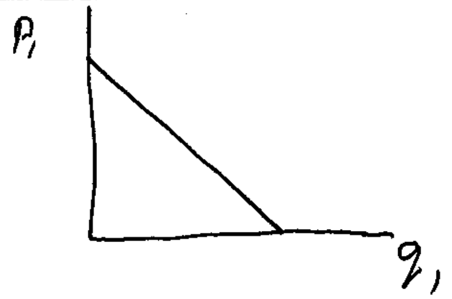
Linear Demand

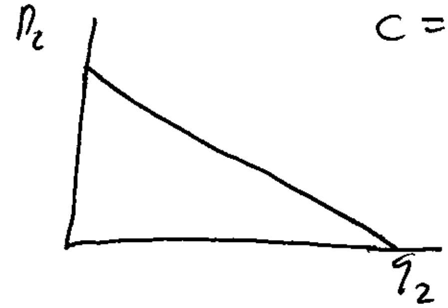
$q_i = a_i - b_i p$

c = constant marginal cost

Ass : $a_i > c b_i$

$\Rightarrow$ all markets served.





$\rightarrow P_i = \dfrac{a_i + c b_i}{2 b_i} \Leftarrow \max_p (p-c)(a-bp)$

$a - 2bp + bc = 0$

$\dfrac{a+bc}{2} = p$

$\rightarrow q_i = \dfrac{a_i - c b_i}{2} \rightarrow \sum q_i = \dfrac{\sum a_i - c \sum b_i}{2}$

Monopoly Output

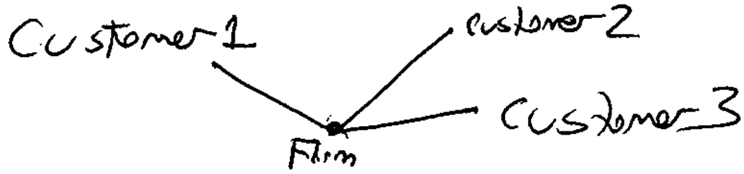
$\max_p \; (p-c) \sum q_i = (p-c)\left(\sum a_i - \sum b_i p\right)$

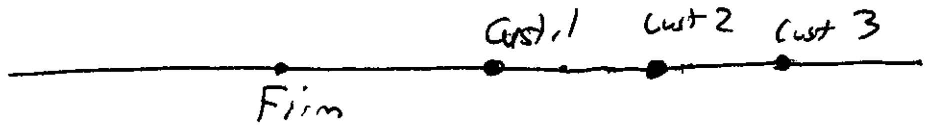
$\rightarrow p = \dfrac{\sum a_i + c \sum b_i}{2 \sum b_i}, \quad q = \dfrac{\sum a_i - c \sum b_i}{2}$

Output in total stays the same! (Robinson 1933)

Thus, PD hurts welfare, since it distorts the allocation of that q.

Spatial Discrimination





It costs tx to sell to the customer at distance x. Using interbuyer P.D.; for $q = a - bp$,

$$\max_p \pi = (p-c)\, q(p+tx) = (p-c)\left[a - b(p+tx)\right]$$

$$\rightarrow \quad \frac{d\pi}{dq} = 0 = a - 2bp + cb - txb$$

$$2bp = a + cb - txb$$

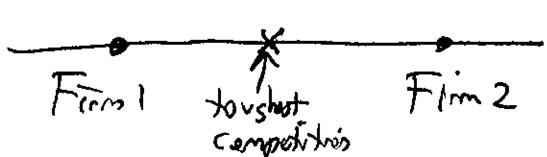
$$p = \frac{a+cb}{2b} - \underbrace{\frac{tx}{2}}_{\text{the price reduced by half the transportation cost.}}$$

But the shape of the demand curve is crucial.

(1) Constant elasticity, (intuition?) $\quad q = p^{-\varepsilon} \qquad \Delta(p+t) = \dfrac{tx}{1 - 1/\varepsilon} > tx$

(2) Exponential $\quad q = e^{a-bp} \qquad \Delta(p+t) = tx$

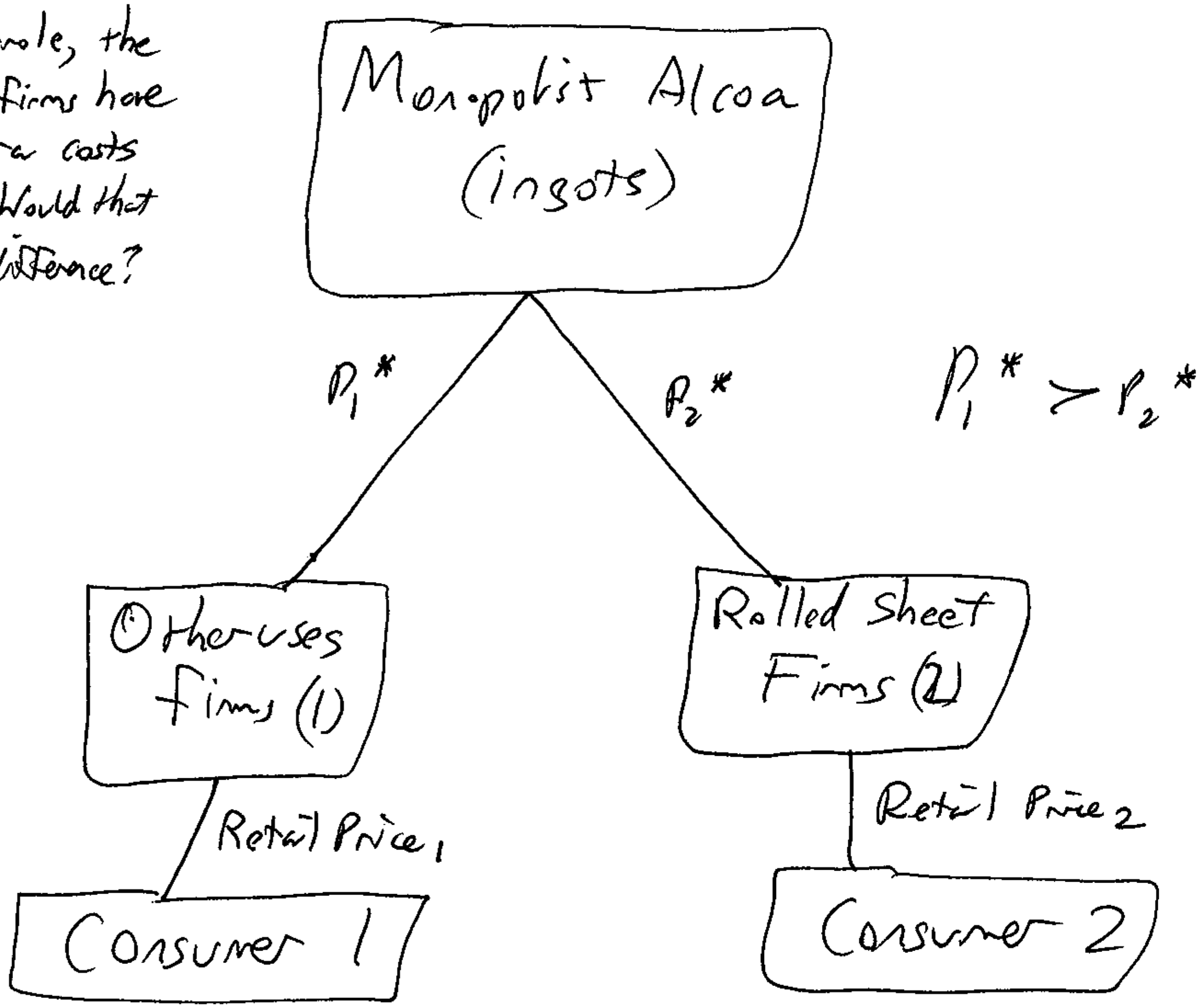
We do see freight absorption a lot. Maybe demand is linear. Maybe competition is stronger further away.



(Basing Point Pricing and Monopoly)

Vertical Controls

In Tirole, the reselling firms have no extra costs or value. Would that make a difference?



less elastic

more elastic

The problem is resale ~~from~~ of ingots from rolled sheet firms to other firms. How can Alcoa stop that?

(1) Vertical Integration into both markets

(2) Vertical integration into Rolled Sheets (and just ~~discriminate against~~ charge P_1^* to all firms).

(3) Contract Restrictions forbidding Rolled Sheet firms to resell, (White motor company case – only the monopolist can sell to the government

Backwards Integration Katz (1987)

Suppose a monopolist sells to a local store and a chainstore in Bloomington and other cities. The chainstore (Walmart) can integrate upwards, making the good itself, at fixed cost F. MC is the same for both (Cournot competition by stores?)

Will integration happen? No. (Coase Theorem).

The chainstore could spread F over all its cities, so it has a credible threat to integrate.

If the monopolist cannot ~~integrate~~, price discriminate, though, the chainstore might integrate in equilibrium.

Why? - To reduce the price for the chainstore, the price for the local store must fall too. Maybe the monopolist prefers to make all his profit from the local store.

(Cournot competition, or some ~~protected~~ monopolized customers model)

It can happen that the uniform price can be lower than both PD prices. Why?

- under uniform pricing, the monopolist keeps his price low. If he can PD, he raises the price a lot to the local store. But then the chainstore is not so tempted to integrate backwards, since competition has fallen - so its price can rise too.