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ECON 2316

Lecture 20:
Market Power and Incomplete Information

Review of two-part tariffs

Suppose a consumer has inverse demand $P = 20 - 4q$

For a store, $TC = 2000 + 2q$ $(MC = 2)$

a) What is the membership fee and per-rental fee?

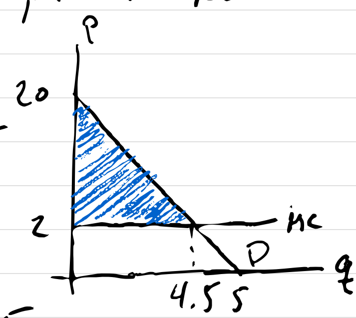
$P = MC$, so $P = 2$

$T = CS$, so

$18/4 = 4.5$

$T = \frac{1}{2}(18)\left(\frac{18}{4}\right)$

$= \frac{18 \cdot 18}{8} = \frac{81}{2} = 40.5$



b) If there are 100 identical consumers, what is π?

$\pi = TR - TC$

$= 100 \times (T + q \cdot P) - (2000 + 2 \cdot 100q)$

$= 100 \times (40.5 + \cancel{200q}) - (2000 + \cancel{200q})$

$= 4050 - 2000 = 2050$

c) How does this compare to a uniformly pricing monopolist?

$$P = 20 - 0.04q$$

$$MR = 20 - 0.08q, \quad MC = 2$$

$$20 - 0.08q = 2$$

$$q = \frac{18}{0.08} = 225$$

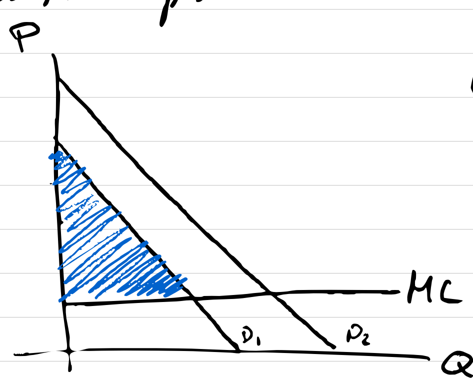
$$P = 20 - \cancel{0.04}\left(\frac{18}{\cancel{0.08}^{2}}\right)^{a}$$

$$= 11$$

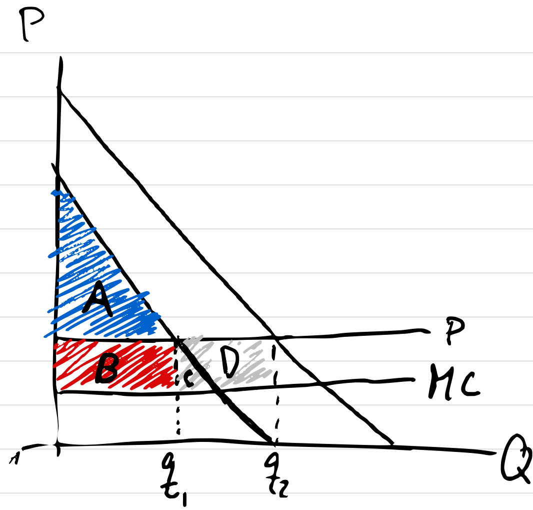
$$\pi = (225 \cdot 11) - (2000 + 2 \cdot 225)$$

$$\pi = 25$$

2 Consumer Types



Option 1:
$P = MC$, $T =$ low CS



Option 2: $P > MC$

Firm Surplus from type 1 = $A + B$

From type 2: $A + B + C + D$

A = membership fee

B = revenue from $P > MC$

$C + D$ = type 2 revenue from $P > MC$

To find P: max PS $\Rightarrow \max\left[2T + (P - MC)(q_{t_1} + q_{t_2})\right]$

Bundling

Bundling - selling 2+ products as a package

Bundling increases profit if demands are negatively correlated

- Selling goods separately
  - reach all consumers at a low price... or
  - charge high price to fewer
- Reach all consumers by charging a medium price

Example:

	Reservation Price		
Consumer	Prod 1	Prod 2	Total
A	20	100	$\Sigma_i = 120$
S	60	60	$\Sigma_i = 120$
T	100	20	$\Sigma_i = 120$

$MC_1 = MC_2 = 30, \; FC = 0$

Individually: $P_1 = 100 \rightarrow q = 1, \rightarrow \pi = 100 - 30 = 70$

$P_2 = 100 \rightarrow q = 1, \rightarrow \pi = 100 - 30 = 70$

$\boxed{\pi_{total} = 140}$

Bundle (forced): $P_{bundle} = 120$

$$\boxed{\begin{aligned}\pi &= (3 \times 120) - (3 \times 60) \\ &= 360 - 180 = 180\end{aligned}}$$

Consumer Choice (Mixed Bundling):

$P_{bundle} = 120 \rightarrow$ Simon buys bundle

$P_1 = 99.99 \rightarrow$ Theodore would get 1¢ surplus buying only product 1 compared to 0 surplus w/ the bundle

$P_2 = 99.99 \rightarrow$ Same logic as ↗ w/ Alvin

$\boxed{\pi = 199.98}$ $([120 + 2 \times 99.99] - 120)$ 4×30

Risk and Uncertainty

Payoff - value associated w/ an outcome

Expected Value:

$$\boxed{\mu = E(X) = \sum_i x \, P(X=x)}$$ weighted average

Standard Deviation:
- extent to which possible outcomes of an uncertain event differ from the mean

Preference Towards Risk

$$\boxed{E(U) = \sum_{\text{all } x} U(x) P(x)}$$

St. Petersburg Paradox
- Suppose we play a game
  - toss a coin until you get tails

Tails on 1 - you get \$2
Tails on 2 - you get \$4
Tails on 3 - you get \$8, and so on
⋮

$$E(\text{game}) = 2 \times \tfrac{1}{2} + 2^2 \times \tfrac{1}{4} + 2^3 \times \tfrac{1}{8} \cdots$$
$$= 1 + 1 + 1 \cdots = \infty \;???$$

Expected Utility of this example

Suppose $\underbrace{U(I)}_{\text{utility of income}} = \ln(I)$

$$E(U) = \ln(2)\cdot\frac{1}{2} + \ln(4)\cdot\frac{1}{4}\ \cdots$$

$$= \sum_{n=1}^{\infty} \ln(2^n)\cdot\frac{1}{2^n}$$

$$= \sum_{n=1}^{\infty} n\ln(2)\cdot\frac{1}{2^n}$$

$$= \ln(2)\sum_{n=1}^{\infty}\frac{n}{2^n}$$