Lecture 7 — 26 Sept. 07

Last time: Imperfect Competition

Cournot - quantities

Bertrand competition - prices

players 2 firms identical product

Costs - constant marginal costs $= c$

« **strategies** » firms set prices p_1, p_2

$S_i: 0 \leq p_i \leq 1$

$Q(p) = 1 - p$ «where p is the lower of the prices»

demand for firm 1 $q_1 = \begin{cases} 1-p_1 & \text{if } p_1 < p_2 \\ 0 & \text{if } p_1 > p_2 \\ \frac{1-p_1}{2} & \text{if } p_1 = p_2 \end{cases}$

payoffs $[q_1]p_1 - [q_1]c = [q_1](p_1 - c)$ (revenues, costs)

$$BR_1(p_2) = \begin{cases} p_1 > p_2 & \text{if } p_2 < c \\ p_1 = p_2 - \varepsilon & \text{if } p_2 > c,\ p^{MON} \geq p_2 \\ p^{MON} & \text{if } p_2 > p^{MON} \\ p \geq c = p_2 & \text{if } p_2 = c \end{cases}$$

$NE = (p_1 = c, p_2 = c)$

«why no other NE? Suppose ... » $(c, c+3\varepsilon)$

c: not $BR_1(p_2 = c+3\varepsilon) = c + 2\varepsilon$; $c+3\varepsilon$: $BR_2(p_1 = c)$

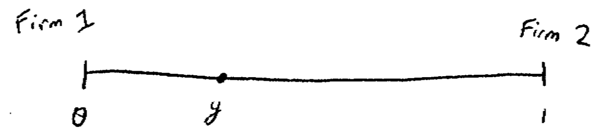
$p = c$, profit $= 0$,

outcome is like perfect competition even though only 2 firms!

Same setting as Cournot, but with a different strategy set

↳ different outcome.

Differentiated Products - Linear City Model



firms set p_1, p_2

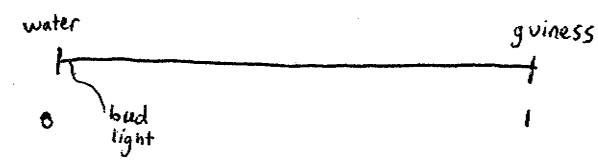
each consumer chooses the product whose **total** cost to her is smaller

for example, at y if buys from Firm 1, pay $p_1 + ty^2$ (transport cost)

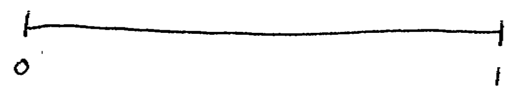
—— 2, —— $p_2 + t(1-y)^2$

[HOMEWORK]

BEER



Candidate - Voter Model



- even distribution of voters
- voters vote for the closest candidate

new ① the # of candidates is NOT fixed [endogenous]

② candidates can not choose their position

each voter is a potential candidate

- players - voters/candidates
- Strategy - to run or not to run
  - voters vote for closest running candidate
  - win if plurality (flip if tie)
- payoffs = $\begin{cases} \text{prize if win} = B \\ \text{cost of running} = c \\ \text{AND if you are at } x \text{ and winner is at } y \rightarrow -|x-y| \end{cases}$ $B \geq 2c$ $(B = 2c)$

eg (i) if Mr x enters and wins $\rightarrow B - c$

(ii) if Mr x enters but Mr y wins $\rightarrow -c - |x-y|$

(iii) If Mr x stays out, Mr y wins $\rightarrow -|x-y|$

Open Yale courses

<< class example >>

$\beta = 2$,
$c = 1$
$x - y = 1 \Rightarrow \frac{1}{17}^{th}$ loss

NE with 0 candidates? - No

NE with 1 candidates? - Yes, if odd # voters and centrist candidate

NE with 2 candidates? - Yes, if equal dist. from center

Open Yale courses