Lecture 8 1 Oct 07

Last time: Voter-Candidate Model

(can not choose position)

lessons (so far)

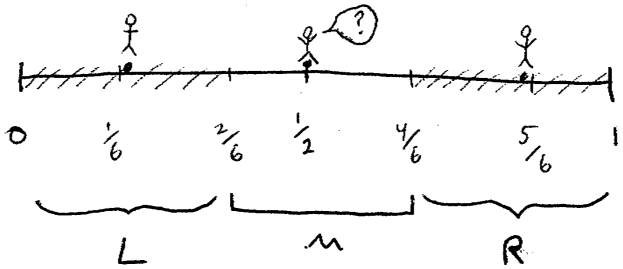
(1) Many NE, not all "at center" (cf. Downs)

(2) Entry can lead to a more distant candidate winning

<< (3) If too far apart, someone will jump into the center >>

<< How far apart can two equilibrium candidates be? >>

<< claim: inside $(\frac{1}{6}, \frac{5}{6})$ >>



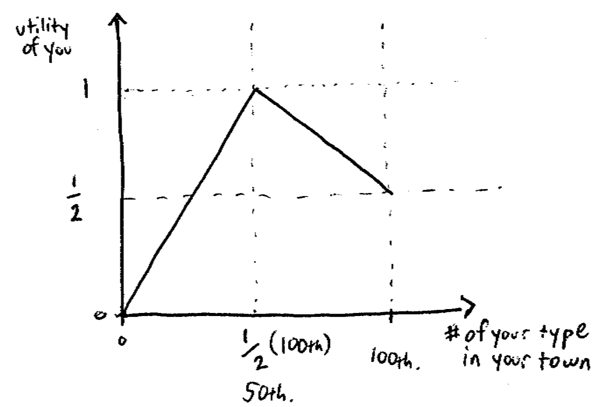
(3) If the 2 candidates are too extreme, someone in center will enter

Game Theory Lesson (4) Guess and check effective

Location Model

strategies: Two towns E and W — holds 100th people

players: Two types of people T and S — 100th of each



Rules: simultaneous choice

if there is no room, then randomize to ration

<< outcome: segregtion >>

<< Equilibria: 2 segregated equilibria

exactly 50-50, integrated >>

<< Integrated equilibria:

- weak equil., indifferent between 2 towns
- Unstable equil. >>

NE (1) Two segregated NE | (T in E, S in W) and vice-versa | "Stab stri

(2) integrated NE | $\frac{1}{2}$ of each in each town | "weak

"Tipping Point"

(3) all choose same town and get randomized

lesson: • seemingly irrelevant details can matter

• having society randomize for you ended up better than active choice

Lessons

① "Sociology" seeing segregation ⇏ preference for segregati

② policy randomization, busing

③ individual randomization NE

↳ randomized or "mixed strategies"

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e.g. Rock, Paper, Scissors

	R	S	P
R	0,0	1,-1	-1,1
S	-1,1	0,0	1,-1
P	1,-1	-1,1	0,0

No NE in "pure strategies"

Pure strategies = $\{R, P, S\}$

Claim: NE each player chooses $(\frac{1}{3}, \frac{1}{3}, \frac{1}{3})$

Expected payoff of R vs $(\frac{1}{3},\frac{1}{3},\frac{1}{3}) = \frac{1}{3}[0] + \frac{1}{3}[+1] + \frac{1}{3}[-1] = 0$

- - - - - - - - S vs (") $= \frac{1}{3}[-1] + \frac{1}{3}[0] + \frac{1}{3}[1] = 0$

- - - - - - - - P vs (") $= \frac{1}{3}[1] + \frac{1}{3}[-1] + \frac{1}{3}[0] = 0$

Expected payoff of $(\frac{1}{3},\frac{1}{3},\frac{1}{3})$ vs $(\frac{1}{3},\frac{1}{3},\frac{1}{3}) = \frac{1}{3}[0] + \frac{1}{3}[0] + \frac{1}{3}[0] = 0$

In RPS, playing $(\frac{1}{3},\frac{1}{3},\frac{1}{3})$ against $(\frac{1}{3},\frac{1}{3},\frac{1}{3})$ is a BR.

So $[(\frac{1}{3},\frac{1}{3},\frac{1}{3}), (\frac{1}{3},\frac{1}{3},\frac{1}{3})]$ is a NE.