14.5-6 Reputation Games

Friday, March 26, 2021 1:27 PM

Expanded Prisoner's Dilemma				
		Carey		
		Share	Compete	Predatory
Ray	Share	10 ; 10	-5 ; 15	-10 ; 0
	Compete	15 ; -5	0 ; 0	-5 ; -5
	Predatory	0 ; -10	-5 ; -5	-10 ; -10

"crazy player"

h = prob of a crazy player
↳ crazy plays share until opp plays share, then predatory once then compete forever

T = last play
↳ at T, sane players compete

at $T-1$ how do sane play if other sane players play share until T

If play compete compete
$(1-h)15 + (1-h)\,0/(1+r) + h(-5/(1+r)) + 15h$

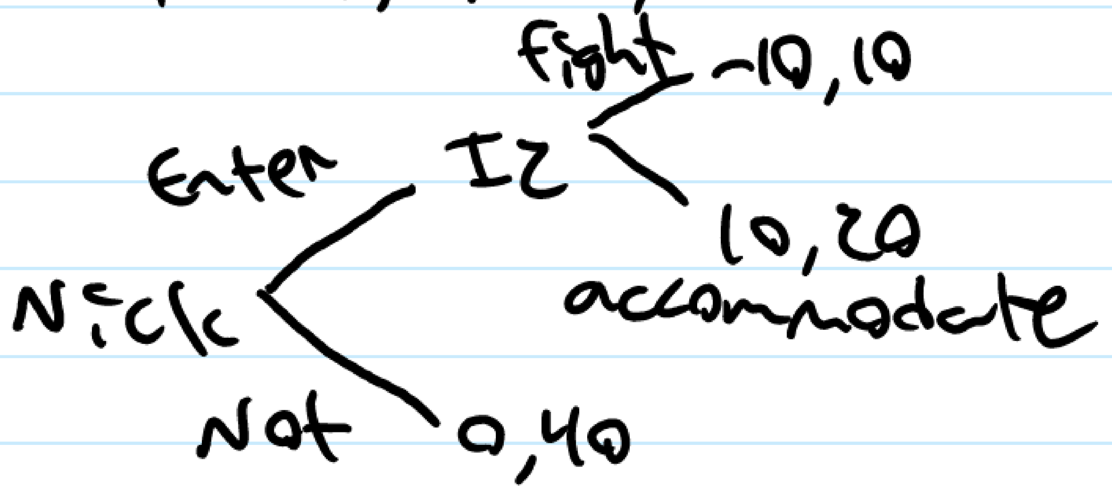
If share compete
$(1-h)10 + (1-h)\,0/(1+r) + h\,15/(1+r) + 10h$

$15 - \frac{h}{1+r}\cdot 5 < 10 + \frac{h}{1+r}\cdot 15 \rightarrow 5 < \left(\frac{h}{1+r}\right)10 \rightarrow \frac{1}{2} < \frac{h}{1+r}$

↳ $1+r < 4h$

$h\uparrow$ or $r\downarrow$
reputation more valuable for maintaining cooperation

At T, players reveal their type



No crazies

h: IZ always fights entrants
V_F: value of rep if IZ fights
V_A: value of rep if IZ accommodates
V: value if IZ does neither

When does sane IZ fight given entry

$10 + V_F > 20 + V_A \rightarrow V_F - V_A > 10 \rightarrow V_F = \frac{40}{1+r} + \frac{40}{(1+r)^2} + \ldots$
$V_A = \frac{20}{1+r} + \ldots$

$\frac{40-20}{r} > 10 \rightarrow 2 > r$

g: P(IZ fights if Nick enters)
Nick out if $0 > (1-h)(1-g)$

Nick out if $0 > (1-h)(1-g)10 + (1-h)g(-10) + h(-10)$
↳ $0 > 10 - 20h - 20g$
$20h(h+g) > 10$
$h+g > 1/2$

↳ crazy can be small if sane IZ is likely to fight