Lecture 12
Finitely Repeated Games

14.12 Game Theory

Muhamet Yildiz

Road Map

1. Entry-Deterrence/Chain-store paradox
2. Finitely repeated Prisoners Dilemma
3. A general result
4. Repeated games with multiple equilibria

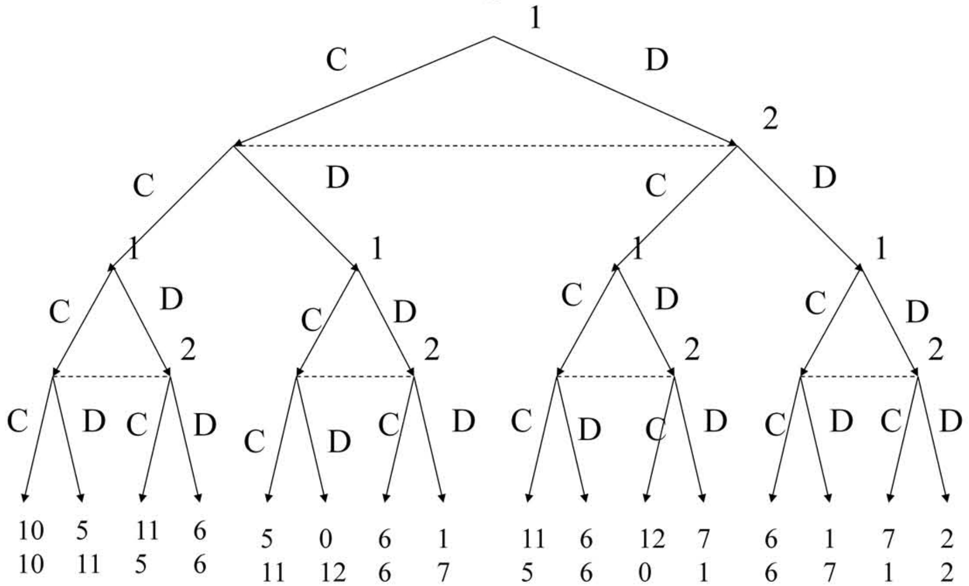
Prisoners' Dilemma, repeated twice, many times

- Two dates T = {0,1};
- At each date the prisoners' dilemma is played:

	C	D
C	5,5	0,6
D	6,0	1,1

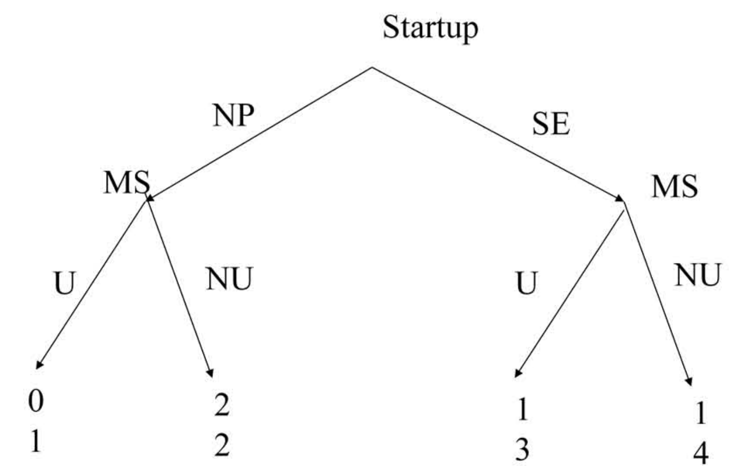
- At the beginning of 1 players observe the strategies at 0. Payoffs= sum of stage payoffs.

Twice-repeated PD

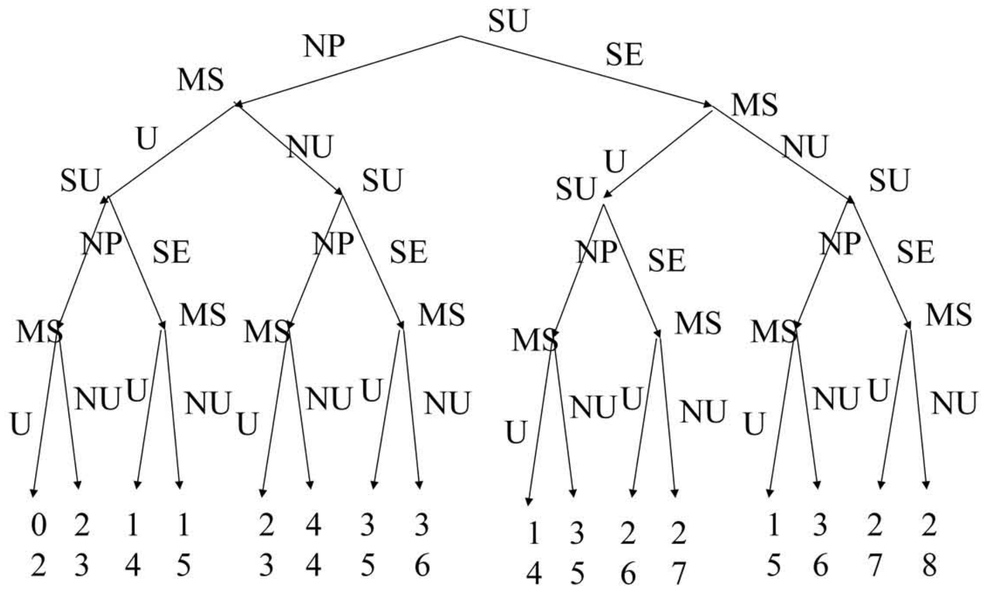


What would happen if T = {0,1,2,…,n}?

Microsoft v. a Startup

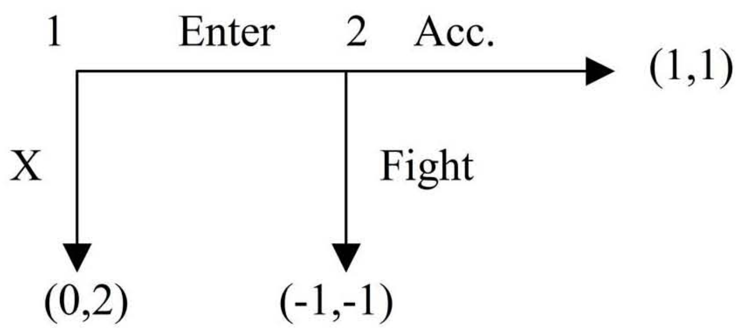


Microsoft v. Startups

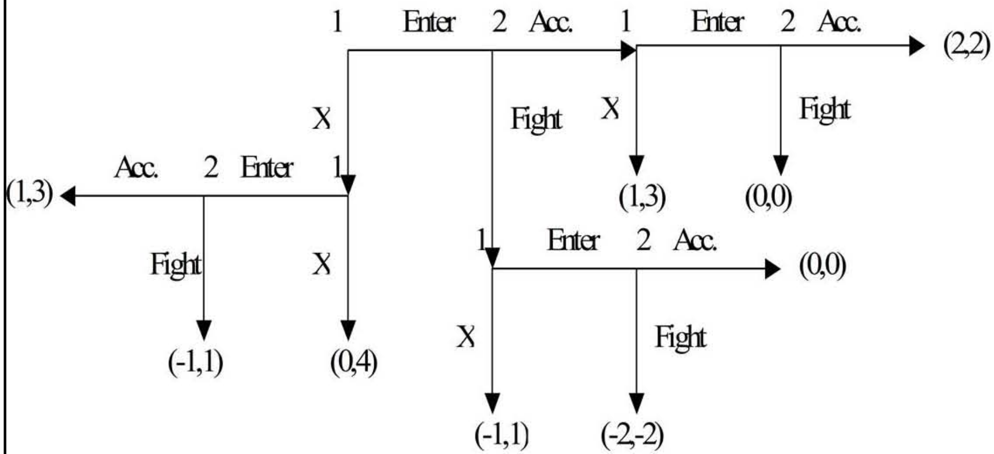


What would happen if there are n startups?

Entry deterrence



Entry deterrence, repeated twice



A general result

- G = “stage game” = a finite game
- T = {0,1,…,n}
- At each t in T, G is played, and players remember which actions taken before t;
- Payoffs = Sum of payoffs in the stage game.
- Call this game G(T).

Theorem: If G has a unique subgame-perfect equilibrium s*, G(T) has a unique subgame-perfect equilibrium, in which s* is played at each stage.

With multiple equilibria

T = {0,1}

1 \ 2	L	M	R
A	1,1	5,0	0,0
B	0,5	4,4	0,0
C	0,0	0,0	3,3

s* =
- At t = 0, play (B,M)
- At t = 1, play (C,R) if (B,M) at t = 0, play (A,L) otherwise.

	L	M	R
A	2,2	6,1	1,1
B	1,6	7,7	1,1
C	1,1	1,1	4,4

Can you see on the path of SPE?

T={0,1}

	L	M	R
A	1,1	5,0	0,0
B	0,5	4,4	0,0
C	0,0	0,0	3,3

- (B,M) (B,M)
- (B,M) (A,L)
- (B,L) (C,R)
- (C,L) (C,R)
- Take T={0,1,2}
- (C,L) (B,M) (C,R)

14.12 Economic Applications of Game Theory
Fall 2012