GEQ1000

Economics

(Social Science)

2.3 Experimenting with the Model

Recap

Prisoner's Dilemma

Players, strategies, outcomes

Nash Equilibrium

Experimenting with the Model

What will happen
if we change an assumption?

The Prisoner's Dilemma

		Player 2: Cooperate	Player 2: Defect
Player 1	Cooperate	4 , 4	0 , 6
	Defect	6 , 0	2 , 2

Change the pay-offs

		Player 2: Cooperate	Player 2: Defect
Player 1	Cooperate	4 , 4	0 , 6
	Defect	6 , 0	2 , 2

Change the pay-offs

		Player 2	
		Cooperate	Defect
Player 1	Cooperate	4 , 4	0 , 3
	Defect	6 , 0	2 , 2

Change the pay-offs

		Player 2: Cooperate	Player 2: Defect
Player 1	Cooperate	4 , 4	0 , 3
	Defect	3 , 0	2 , 2

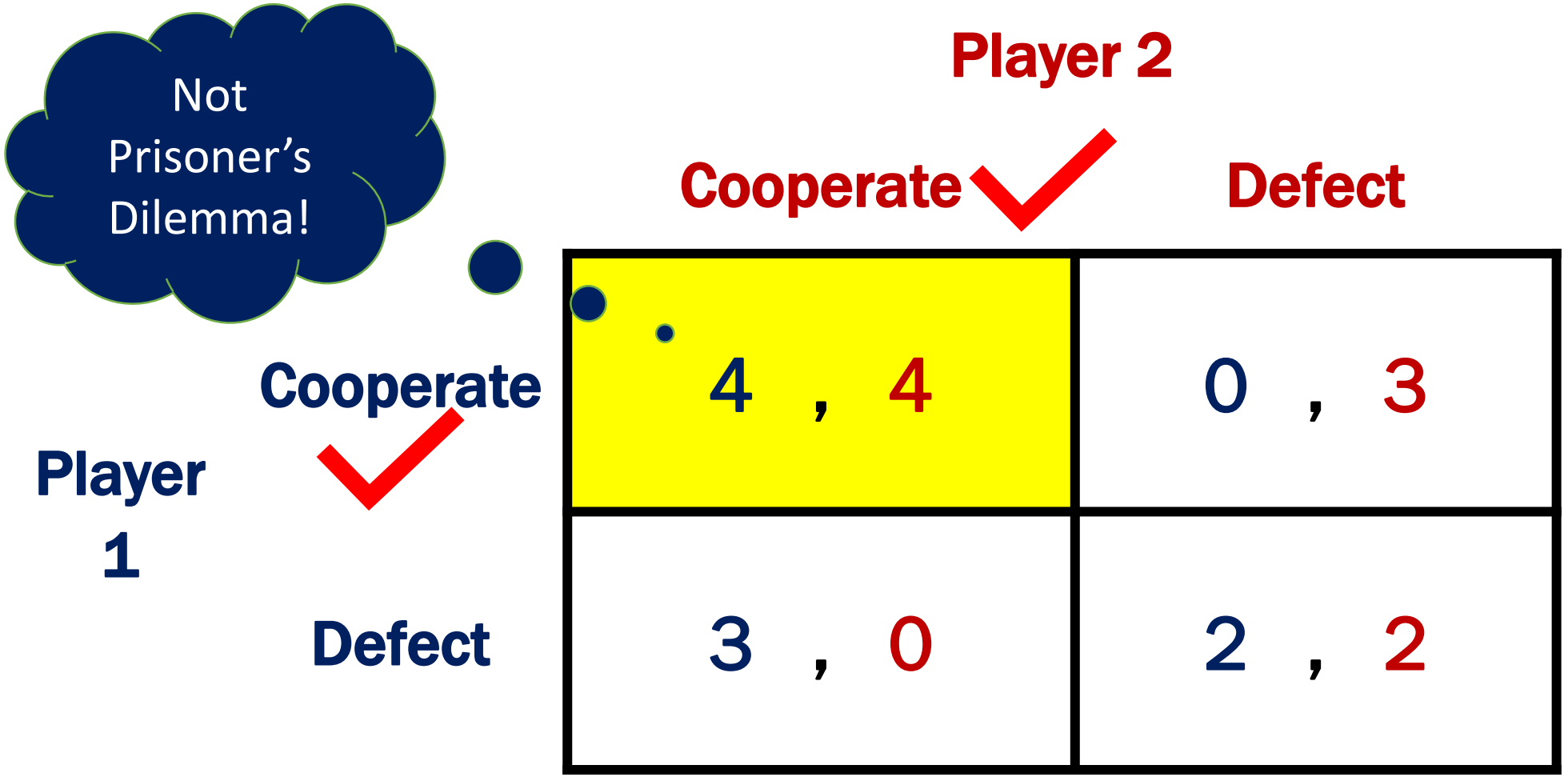
At (Cooperate, Cooperate)
Player 1 won't change his strategy

Player 1 \ Player 2	Cooperate	Defect
Cooperate	4 , 4	0 , 3
Defect	3 , 0	2 , 2

At (Cooperate, Cooperate)
Player 2 won't change his strategy

Player 1 \ Player 2	Cooperate	Defect
Cooperate	**4**, **4**	0, **3**
Defect	3, 0	2, 2

(Cooperate, Cooperate) is a Nash Equilibrium

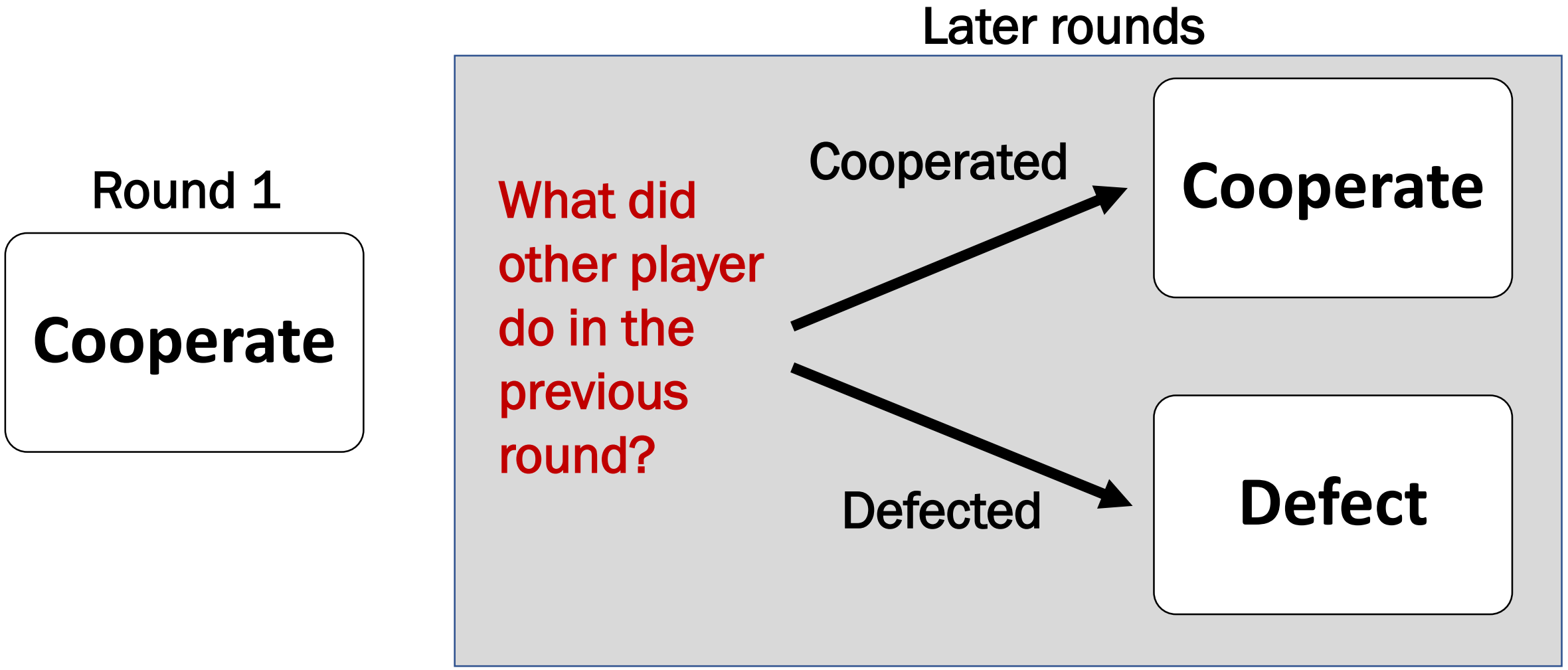


Repeating the Game

Play Prisoner's Dilemma multiple times (*Iterated Prisoner's Dilemma*)

Can observe what other player did in previous rounds

Possible strategy: Tit-for-Tat

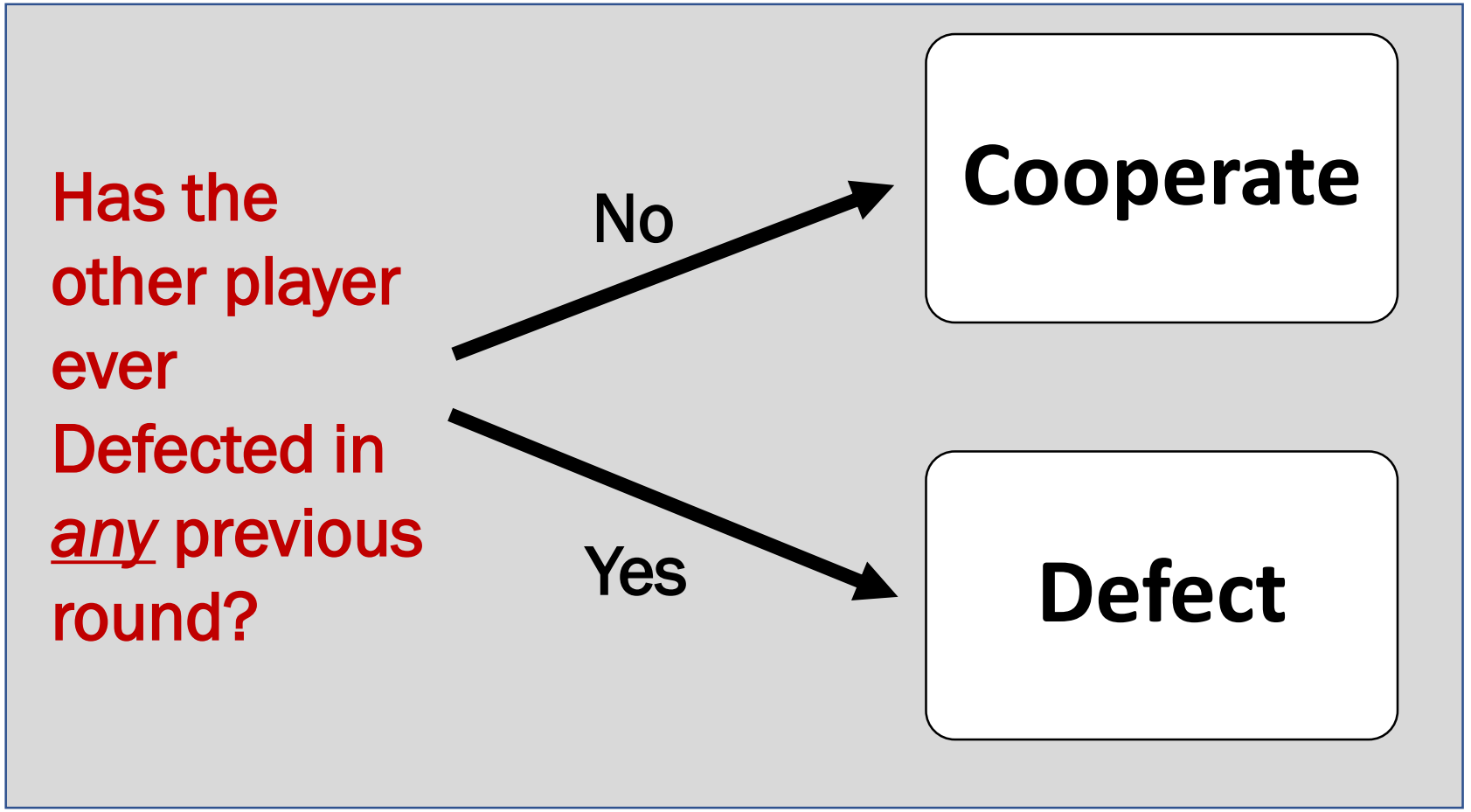


Possible strategy: Grim-Trigger

Round 1

Cooperate

Later rounds



Repeating the Game

With Iterated Prisoner's Dilemma

Cooperation is now *possible*

Repeating the Game

In a famous 1980 repeated Prisoner's Dilemma tournament …

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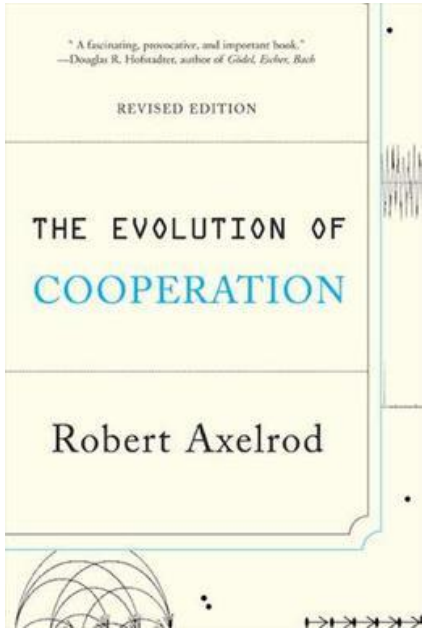

… the winnng strategy was *tit-for-tat*

Next up:
Applying the Model