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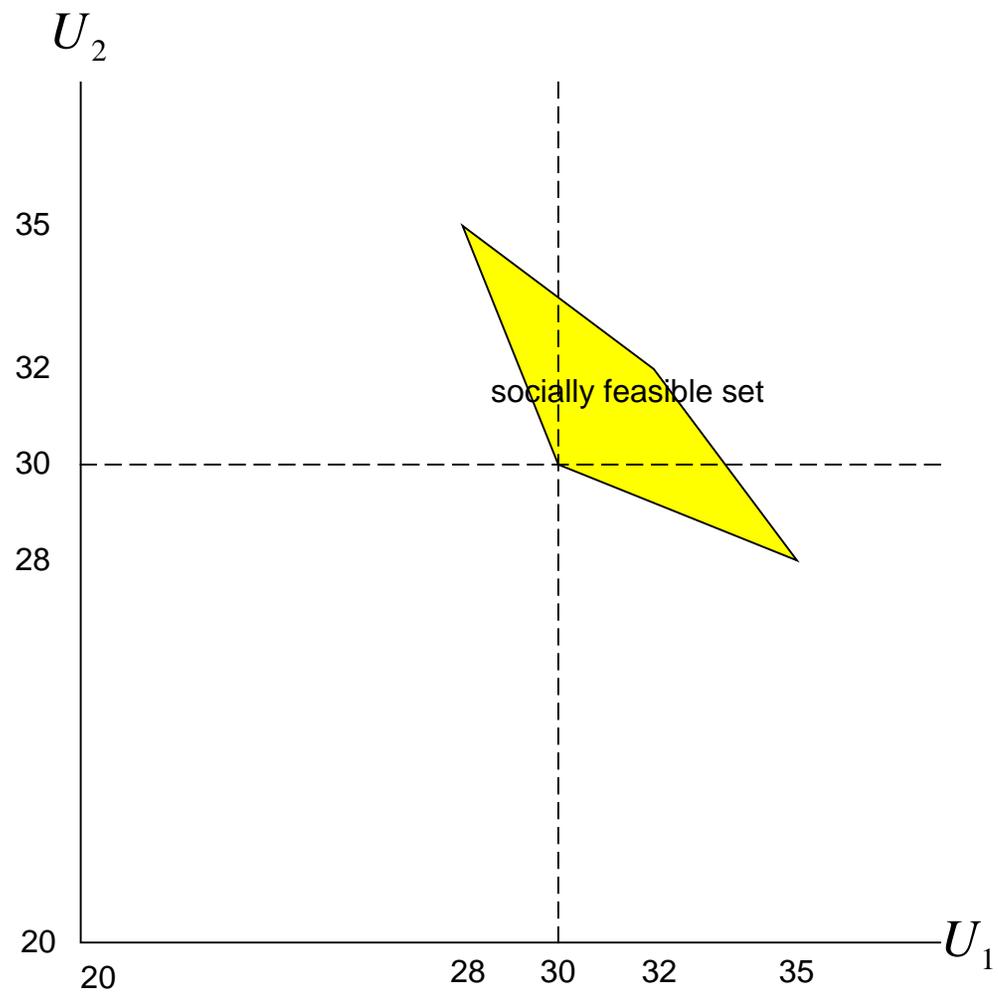
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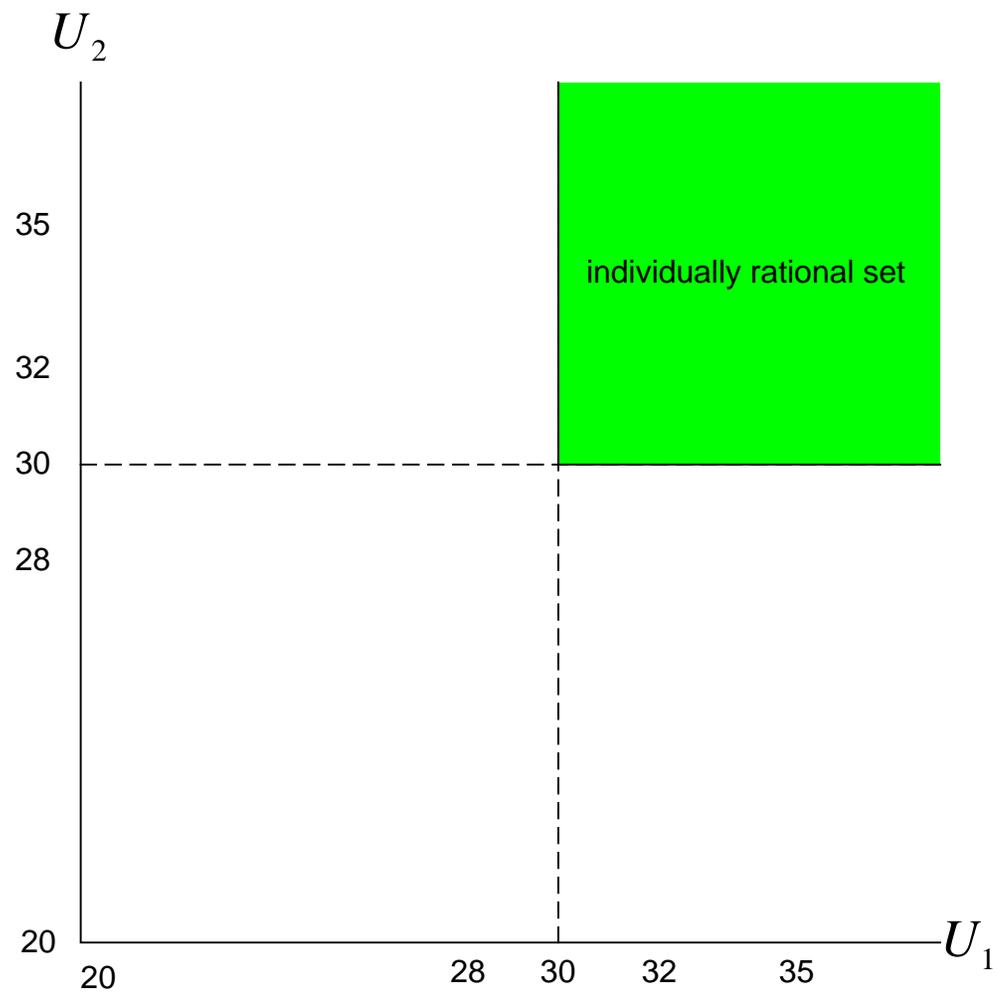
# The Folk Theorem

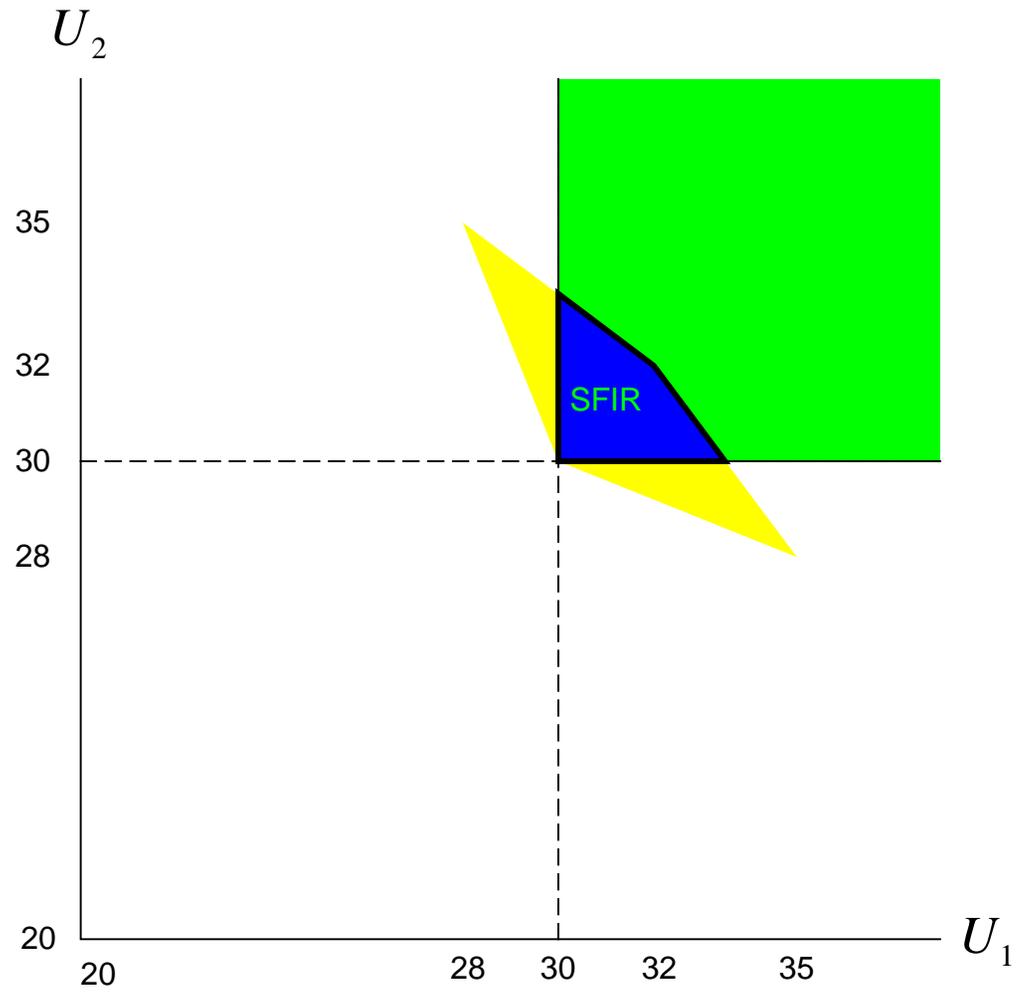
- individual rationality: each player gets at least what they can get when they know the other player's strategy
- social feasibility: there is some combination of strategies that gives players the given average present value of utility

## *Prisoner's Dilemma*

	Player 2	
Player 1	don't confess	confess
don't confess	32,32	28,35
confess	35,28	30,30







## ***The Folk Theorem:***

the entire socially feasible individually rational set (except possibly the boundaries) are subgame perfect equilibrium for discount factors close enough to one.

- we know two equilibria - the static Nash equilibrium at (30,30) and the grim strategy equilibrium at (32,32)

## ***Minmax and Maxmin***

### *Minmax:*

Player 1 knows player 2's strategy and does the best he can

Player 2 hurts player 1 as badly as possible

$$\min_{s_2} \max_{s_1} u_1(s_1, s_2)$$

example

		Player 2	
		L	R
Player 1	U	2,3	3*,2
	D	4*,2	1,1

\* marks best for player 1

should 2 play L(4) or R(3)? Choose R(3)

Minmax is player 1's *individually rational* payoff level

Similar analysis for player 2

*Maxmin:*

Player 2 knows player 1's strategy and hurts player 1 as badly as possible

Player 1 tries to prevent the loss

$$\max_{s_1} \min_{s_2} u_1(s_1, s_2)$$

example

		Player 2	
		L	R
Player 1	U	2*,3	3,2
	D	4,2	1*,1

\* marks worst for player 1

should 1 play U(2) or D(1)? Choose U(2)

Similar analysis for player 2

notice always  $\max \min \leq \min \max$

Minmax (and not the maxmin) is player 1's *individually rational* payoff level