

Governance As a Strategy in State-of-Nature Games

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A familiar story...

- Before government, there was a state of nature
- This state of nature (SON) can be modelled as a Prisoner's Dilemma (PD) game
- Via coercion, government moves us to our happy place (universal cooperation)
- Now, all we have to figure out is how to control the government. (By voting?)

...with a logical flaw

- The PD game rules out the possibility of coercion effected by players of the game.
 - There are only two moves, C and D
 - There is no “make other player move C” move
- A state of nature modelled with a PD game is thus inconsistent with the existence of an internal coercive actor...
- ...which is exactly what a government is.

What to throw away and what to keep?

- Which is more valuable: the illustration of the SON with a PD game, or the notion that government is an internal coercive actor?
- I personally am prepared to entertain the notion that both are not very useful...
- ...but this paper decides to save the second notion at the expense of the first.
- I create a SON game where coercion is possible.

A PD game modified to allow for coercion

- Two players, simultaneous play, one shot
- Each player chooses C or D
- Each also chooses whether to incur a cost X in order to impose C move on other player
- Disutility of Y from being imposed upon
- Normal form game expressed in 4x4 table

Dense slide that looks impressive

		Player 2			
		Cooperate	Cooperate/ Impose	Defect/ Impose	Defect
Player 1	Cooperate	c_1, c_1	$c_1 - Y, c_1 - X$	$c_0 - Y, d_1 - X$	c_0, d_1
	Cooperate/ Impose	$c_1 - X, c_1 - Y$	$c_1 - X - Y, c_1 - X - Y$	$c_1 - X - Y, c_1 - X - Y$	$c_1 - X, c_1 - Y$
	Defect/ Impose	$d_1 - X, c_0 - Y$	$c_1 - X - Y, c_1 - X - Y$	$c_1 - X - Y, c_1 - X - Y$	$d_1 - X, c_0 - Y$
	Defect	d_1, c_0	$c_1 - Y, c_1 - X$	$c_0 - Y, d_1 - X$	d_0, d_0

After elimination of weakly dominated strategies...

		Player 2	
		Defect/Impose	Defect
Player 1	Defect/ Impose	$c_1 - X - Y, c_1 - X - Y$	$d_1 - X, c_0 - Y$
	Defect	$c_0 - Y, d_1 - X$	d_0, d_0

- This reduced game is not necessarily another PD. Its nature varies depending on base payoff values, the cost to coerce, and the disutility from being coerced.

Efficiency of the coercive option

- I apply standard solution concepts and then compare outcomes to the classic PD result:
- When it is cheapest to coerce (assuming given base payoffs and disutility from being coerced), having the option to coerce results in a Pareto improvement
- When it is somewhat expensive to coerce, having the option results a Pareto loss
- When it is most expensive to coerce, there is no difference (because no one will pay to coerce)

But more importantly

- We have players unilaterally acting to coerce others to choose C, i.e., governance is effected by self-interested individuals
- In certain value ranges the conventional solution concept is mixed strategies, which could result in one player governing and the other player choosing not to govern, i.e., emergence of a government