Drug Wars, Crackdowns, and Policy Design under Collusion:

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Title: A Repeated Game Model of Drug Wars and Crackdowns

Abstract: This paper studies why drug trafficking organizations attack each other and why more conflict breaks out under some government crackdowns in a repeated game. This is motivated by the observation that such violence rose following some crackdowns (e.g. Mexico after 2006) but not others. We consider a duopoly model where firms can attack each other. In the one-shot game, attacking is individually profitable, since it removes competing drugs from market, but socially costly; increasing law enforcement increases costs and (weakly) decreases violence. In the repeated game, firms collude as much as possible, sustaining peaceful cooperation (high profits) with the threat of punishments (including violence), which are occur in equilibrium due to imperfect monitoring. A very powerful government can fully eliminate violence by shutting down the market, but for a less powerful government, an "indiscriminant crackdown" can cause a breakdown in collusion (by making cooperation less profitable), sparking more violence. Instead, a "coordinated crackdown," cracking down during war but not peace, helps firms collude more, achieving lower violence than either an indiscriminant crackdown or zero enforcement.

Title: Policy Design Under Collusion
(with Stefano Barbieri, Brent Venable, and Zizhan Zheng)

Abstract: We develop an algorithm for characterizing optimal policy when agents cooperate in a repeated setting. Possible applications include auction design under bid-rigging or cooperation between firms in a market, where collusion could be both and not. A repeated game is played by a government and some other agents ("players"), where the government announces its strategy in advance (a "policy"), which effectively constructs a dynamic game. The players "collude" as best they can by selecting the player-optimal strongly symmetric equilibrium. Using a recursive characterization of collections of payoff sets, we develop a computer-implementable algorithm that constructs an approximately government-optimal dynamic game, given player collusion. Approximations of generated collections are computed using a sequence of mixed integer linear programs. We illustrate the algorithm in a simple prisoner's dilemma between two players where a government seeks to minimize players' payoffs (despite collusion) by shifting the stage game payoffs.