Structural Modeling Approach to Studying Crime

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  - A different way: structural approach.

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- Two types of structural models in the literature
  - One that focuses on individual decisions.
  - One that embeds individual decisions into an equilibrium framework to study the determination of crime.

Individual Decision Models of Crime

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     Changes in policies $\rightarrow$ changes in the relative benefits of criminal versus non-criminal activities $\rightarrow$ changes in crime participation.
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- Examples: Imai and Krishna (2004) and Fu, Grau and Rivera (2022) on teenage crime.

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4. "Luck": contemporaneous shocks and noises, which may have long-term impacts via their impacts on one's current choice.

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- The teenager's decision is made based on his expectation about the net (current+future) benefits of each choices, where the expectation is *based on his updated belief about himself.*

Fu, Grau and Rivera (2022): Estimation

- The model is estimated using three data sets from Chile that are linked at individual level:
  - Panel of student records from Grade 1 (2002) to Grade 12
  - Standardized tests, family background survey
  - Criminal records of all arrested youth between 2006 and 2014

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  3. Enhancing Policy 1 or Policy 2 with full high school tuition subsidies would double the impact.

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- Examples: Imrohoroglu, Merlo and Rupert (2000), Fu and Wolpin (2018)

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- We need to understand how crime is determined.

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  - Cities differ in their productivity, police efficiency and marginal costs of police.

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  - the rental rate of human capital: decreases with the supply of labor

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- Such multiplicity is an inherent property of the structure, as long as there arrests become more difficult as crime rates go up.
  - However, generally speaking, characterizing the set of all possible equilibria is infeasible.
  - Given certain functional form assumptions, all potential equilibria can be computed and they are ranked by their crime rates, the number of possible equilibria is bounded above by the number of individual types.

Government Problem

- Realizing the fact its choice of police force will affect the set of equilibria, the government makes its decision to minimize its expected loss, where the expectation is taken over all possible market equilibria.

Estimation

- Using data from CPS and UCR, estimate via GMM the fundamental parameters that govern
  - individual preferences
  - government preferences
  - technologies: arrest, production.
  - the distribution of unobserved heterogeneity across individuals conditional on observables
  - the distribution of unobserved heterogeneity across MSA's
  - the distribution of multiple equilibria (equilibrium selection probabilities)

Counterfactual Experiments

- Uniform increase in police force across all MSA's;
- Voluntary participation:
  - The planner subsidizes a certain percentage of newly hired police.
  - Local governments choose whether or not to participate and if so, how many new officers to hire.
- Targeted resource allocation: given a fixed budget and policy goal (e.g., minimizing overall crime rate), how to allocate resources across different MSA's?

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