Law and Economics

Crime Law

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Introduction

- Not all crime is *rational*.
  - *Crime of passion*.
- Some crimes respond to clear economic incentives.
  - Embezzlement.
  - Insider trading.
  - Tax evasion.
- Economic approach to crime.
  - Based on rational trade-off between costs and benefits.

Distinguishing Crimes and Torts

- What distinguishes crimes from torts?
- Both involve (in general) harm to persons of property.

- **Legal action**:
  - Tort: initiated by the victim.
  - Crime: initiated by the state.
  - Why does this difference exists?

Distinguishing Crimes and Torts

- **Intention**:
  - In general, tort involves accidents.
  - Crime is generally intentional.
  - However:
    - Intent is a continuum.
    - Generally unobservable.

- Why is legal action for crimes initiated by the state?
  - Intentional offenders might try to cover up to avoid responsability.
    - This makes it difficult for victims with limited resources to carry out the process against offenders.

Distinguishing Crimes and Torts

- Scale economies.
  - High fixed costs $\rightarrow$ natural monopoly.
- Complementarities prosecution- police force.
- Public harm in addition to direct harm.
  - Examples:
    - Fear.
    - Durable goods purchase decision.
    - Private investment in security.
  - Victims might not have sufficient incentives to pursue compensation.

Becker Seminal Article

- **Basic assumption**: in the decision to whether to commit a crime, offenders compare the gain from the act with the expected punishment.
  - This decisions generate a *supply function* of offenses.

- Given the *supply function* of offenses, policymakers determine the optimal punishment scheme.
  - Probability of apprehension.
  - Punishment on conviction (fine or imprisonment).

Becker's Setup

- Setup
  - g: gain from crime. Random variable with cdf G.
  - h: harm to the victim (constant).
  - p: probability of apprehension.
  - f: fine.
  - t: time of imprisonment.
  - c: cost of imprisonment to the offender (per unit of time).

Offender's Decision

- Who commits crime? Only those with

$$g > p(f + c \cdot t)$$

- Total crime:

$$1 - G(p(f + c \cdot t))$$

  - Notice that if $G(h) < 1$, the *efficient* level of crime is positive.

Optimal Punishment

- Authority chooses: p, f, t.

- Social Welfare Function:
  - Dilemma: should offender's utility be consider in the aggregation?
    - Standard Practice: include offender's benefit.

Optimal Fine ($t = 0$)

- set $t = 0$ and fix p.
- Crime if $g > p \cdot f$.
- social welfare:

$$a \cdot (g - h)$$

- Problem of the offender:

$$\max_{a} \qquad a \cdot (g - p \cdot f)$$

- **Harm-based solution**: Set expected punishment equal the harm.
  - No need to know anything about the distribution of g.

Gain-based Fine

- Consider the following **gain-based fine**:

$$f = g/p$$

- If indifferent agent commits no crime, this fine deters all crimes.

$$\max_{a \in \{0,1\}} \quad a\left(g - p \cdot \frac{g}{p}\right)$$

- Efficient when efficient level of crime is zero.
- **Advantage**: if gains of offender are easier to measure than the harm to the victims.
- **Example**: Insider trading.

Optimal imprisonment

- Prison is costly to the offender, but also to society.

- Thus, it is optimal to use fines up to the maximum wealth of the offender before prison is used.

$$f^* = \begin{cases} h/p & \text{if } h/p < w \\ w & \text{if } h/p \geq w \end{cases}$$

Exercise

- Optimal deterrance requires an expected punishment of $ 4000.
- Probability of detection: $p = 0.5$.
- Individual's wealth: $w = \$2000$.
- Cost of jail time $c = \$500$

Optimal Fine with Variable Apprehension Probability

Authority chooses both p and f.

- For any given product $p \times f$, crime is unaffected.
- Authority chooses p and f minimizing the cost of implementation.
  - Fines are not costly.
  - increasing the probability of apprehension is costly.
- The optimal fine should be as high as possible.
- Limit: wealth of the individual.
- (This is one of the central insights of Becker's analysis.)

Optimal Fine with Variable Apprehension Probability

Which iso-deterrance line is optimal?

- Marginal reduction in net social harm = Marginal increase in enforcement costs.
- Underdeterrance is optimal:
  - Suppose that we initially set $pf = h$.
  - Reducing p slightly one saves in enforcement costs, but some additional crimes are committed.
  - However the loss for those crimes is negligible.
  - Thus there is a social gain from lowering p.

Why Are Fines not Equal to Offenders' Wealth?

- Model tell us that fines should be equal to individual's wealth to:
  - Save on enforcement costs.
  - Avoid use of prison.

- This is not observed in practice. Potential reasons:
  - Fines are not costless to impose.
  - Proportionality.
  - Rich and poor should receive equal treatment.
  - Marginal Deterrence.

Standard of Proof

- Prosecutor in a criminal case has a higher standard of proof than plaintiff in a civil case.
  - Civil case: plaintiff's account must be more believable than the defendant's.
  - Criminal case: Prosecutor must prove the case *beyond reasonable doubt*.

- Why higher standards?
  - Type I and Type II errors.
  - State and suspect asymmetry.
  - Prosecutor's career concerns.

Private Protection

- Individuals privately invest in preventing crimes.
  - Locks.
  - Guns.
  - Cameras.
  - Trackers.

- (This relates to the investment in precaution by victims in tort law.)
- There are positive and negative externalities in private crime prevention.

Model with Negative Externalities

- Setup
  - n agents, each of whom owns an item of value v.
  - Agents can invests or not in a precaution technology (lock). Cost c.
  - Thief steals one item from the set that has no lock. (If all items have locks, the criminal does not steal.) For simplicity, assume value zero for the thief.

- Efficient Allocation:
  - Makes no sense to put a lock in less than all items.
  - Put a lock in all items if $v > nc$.

Model with Negative Externalities

- Best response:
  - Suppose that k out the other $n-1$agents have a lock.
  - Best response to get lock if:

$$c < v/(n-k)$$

- If $c < v < nc$, at least two equilibria:
  - Efficient: no one gets the lock.
  - Inefficient: everyone gets a lock.

Model with Positive Externalities

- Setup
  - n agents each of whom owns an item of value v.
  - Agents can invest or not in precaution technology (gun). Cost c.
  - Thief can select at most one agent and robs him. Payoff for thief that robs an agent:
    - $\underline{v} < v$ if agent has no gun.
    - $-G$ if agent has a gun.
  - Otherwise the thief gets zero.
  - Payoff of the agent (not counting the cost of gun):
    - v if he is not robbed.
    - 0 if he is robbed without a gun.
    - $v - G$ if he is robbed with a gun.

Model with Positive Externalities

- If $G \geq v$, then no agent would buy a gun.
  - Thief will rob a random agent.
- If $G < v$, there is a symmetric equilibrium with random strategies.
  - Decision of the thief: indifferent iff

$$\alpha(-G) + (1-\alpha)\underline{v} = 0$$

  - Agent is indifferent between buying gun and not iff:

$$v - c - \beta G = (1-\beta)v$$

Model of Plea Bargaining

- θ: type of the defendant. G for guilty and I for innocent.
- P_θ: Probability of conviction. $P_G > P_I$.
- S: sanction.
- C_d: defendant's cost of trial.

Plea Bargaining

- Expected cost of trial is lower for innocent agents:

$$P_G S + C_d > P_I S + C_d$$

- Prosecutor offers a plea S_0. She can try to:
  a. Go to trial with both types.
  b. Make a plea offer S_0 such that only the guilty will accept.
  c. Make a plea offer that both types will accept.

Plea Bargaining

- Claim: (a) is never socially optimal.
  - The prosecutor can impose the same cost on guilty defendants by offering $S_0 = P_G S + C_d$.
- (b) imposes higher cost on guilty defendants.
- (c) involves lower cost on innocent defendants. Saves the cost of trial of innocent defendants.

Plea Bargaining

- Notice that in (b) all defendants that go to trial are innocent!
  - This might affect how judge or jury read the evidence against the defendant.
  - If this affects the probability of conviction, the plea might not work as desired.

Crime and Drugs

- Drugs are historically associated with crime.
- Important characteristics:
  - Addictive substances.
  - Affect behavior.
  - Some are illegal. (Alcohol is the important exception.)
- Affect crime:
  1. Users might commit crimes to buy drugs.
  2. Users might commit crimes under the influence.
  3. Drug dealers commit crimes to protect and increase their market power.

Crime and Drugs

- Price-elasticity of demand is different for addicts than for casual/new users.

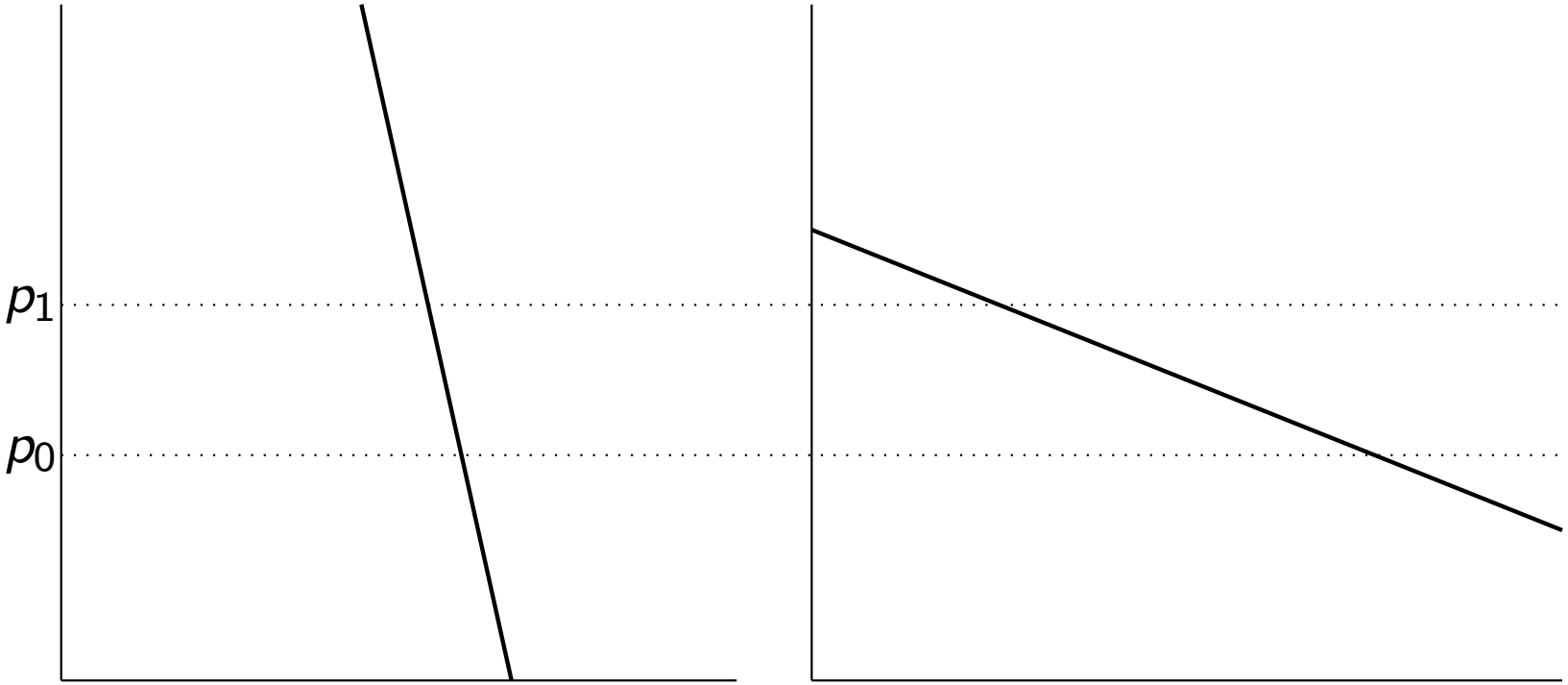

Figure: *

Demand of addict on the left. Demand of casual user on the right.

Crime and Drugs

- **War on drugs**: generate a left-shift of supply curve. Higher equilibrium price.
  - Total expenditure is higher for addicts. Crime 1 increases.
  - Total consumption goes down. Crime 2 decreases.
  - Effect on Crime 3 is undetermined.
  - Dynamic aspect: less addicts in the future.
- **Legalization**: right-shift of supply curve. Lower equilibrium price.
  - Opposite effects.
- **Ideal policy**: reduce price for addicts but increase if for casual users.
  - Addiction registration in the UK.