Dis 9: Criminal Law [†]

1 Review

1.1 Difference from civil law

(Here, civil law is used in the context of civil vs. criminal, instead of civil vs. common law)

	Civil law (including property, contract, and tort law)	**Criminal law**
Intended to do wrong (*mens rea*)	No	Yes
Who brings cases to court	Agents involved (bargaining parties, contracting parties, or injurer and victim)	Government (allows for victimless trials)
Standard of proof	Preponderance of evidence (51% certainty)	Beyond a reasonable doubt (needs to be very certain, since wrongful conviction is very costly)
Goal of punishment	Compensation	Deterrence

1.2 Why is criminal law needed?

Since tort law deals with accidents, why not just extend tort law to cover criminal cases?

- Tort law relies on **perfect compensation**, which may be impossible in criminal cases

  (ex. How to perfectly compensate a victim that has been murdered?)
- **Not all criminals are caught**, so punishment can't just equal to damages caused / benefits that criminal receives
- Criminals might be **judgment-proof**, causing criminals to not fully internalize costs of their actions

1.3 Goal of criminal law: Design criminal law to be efficient

- Tricker than civil law:
  - Criminal activities often destroy values (i.e. lower social surplus), so ex post punishment is inefficient
  - So naturally, criminal law wants to prevent / deter **all** crimes entirely
  - However, there often are costs associated with deterrence & punishment, which makes deterring all crimes costly to achieve
  - Plus, some crimes might be efficient (recall from Tuesday's lecture)

[†] Adapted from Jonathan Becker's Fall 2018 handout

- So what do we do? $\Rightarrow$ A balancing act to minimize the following three sources of social costs:
  - Costs of crimes committed
  - Costs of detecting (catching) criminals
  - Costs of punishing offenders

  In other words, we need to figure out what's the **optimal level of *deterrence* and *punishment*** that yields the lowest overall social costs (and with social benefits held fix, thus maximizes social surplus).

1.4 Optimal deterrence

- **Marginal analysis on determining the optimal level of deterrence**:

$$\text{Marginal cost of deterrence} = \text{Marginal benefit of deterrence}$$

- **Marginal benefit of deterrence**:
  - For one more unit of deterrence, how much value does it prevent from being destroyed by crime
  - Most of the time, a positive number (> 0)
- **Marginal cost of deterrence**:
  - Could be positive or negative! (Recall example from lecture)
  - **Positive marginal cost of deterrence**: One more unit of deterrence is costly

    (ex. Increase in costs from hiring one more policeman $\gg$ Decrease in costs from crimes deterred by this one extra policeman)
    - **What to do if we don't know the exact marginal benefit of deterrence?**
      Cheaper to allow some inefficient crimes to exist
  - **Negative marginal cost of deterrence**: One more unit of deterrence saves money

    (ex. Increase in costs from hiring one more policeman $\ll$ Decrease in costs from crimes deterred by this one extra policeman)
    - **What to do if we don't know the exact marginal benefit of deterrence?**
      Marginal benefit of deterrence is most likely positive, so marginal cost of deterrence will be less than marginal benefit
      $\rightarrow$ Keep on deterring crimes, even though some crimes deterred might be efficient

1.5 Optimal punishment

- **Going back to the marginal analysis on determining optimal level of deterrence**:

$$\begin{aligned}
\text{Marginal cost of deterrence} &= \text{Marginal benefit of deterrence} \\
\text{Marginal cost of deterrence} &= \text{Social costs of marginal crime} \\
\text{Marginal cost of deterrence} &= \text{Harm to victim} - \text{Benefits to criminal} \\
\text{Marginal cost of deterrence} &= \text{Harm to victim} - \text{Expected punishment} \\
&\qquad\qquad \text{(Since marginal criminal is indifferent)} \\
\text{Expected punishment} &= \text{Harm to victim} - \text{Marginal cost of deterrence}
\end{aligned}$$

  - If we have **positive marginal cost of deterrence**:
    Expected punishment $<$ Harm (damage) to victim
    (Costly to prevent the marginal crime, so might as well set the expected punishment low to allow for some inefficient crimes)
  - If we have **negative marginal cost of deterrence**:
    Expected punishment $>$ Harm (damage) to victim
    (Cheap to prevent the marginal crime, so might as well set the expected punishment high to deter even some efficient crimes)
  - If we have **0 marginal cost of deterrence**:
    Expected punishment $=$ Harm (damage) to victim
    (Let offender internalize the costs of their actions, so we will only have efficient crimes to occur)

- **Types of punishments**:
  - **Fines**: Monetary transfer between the criminal and the government
    * Zero change in social surplus $\Rightarrow$ Fines are **efficient**
    * But there is potential for abuse
    * Fines could be a fixed amount for certain offense, or it could be proportional to wealth
  - **Imprisonment**: Put criminals in jail
    * Has the effect of **incapacitating** criminals (prevent criminals from committing more crimes) (Very effective when supply of criminals is inelastic)
    * Imprisonment also deters crime
    * But putting criminals in jail is costly and makes the criminals worse off
  - **Death penalty**: Punish the criminal by death
    * Mixed evidence on death penalty effective in crime deterrence
    * Concern about death penalty applied in a racially biased way

2 Problems

1. Recall that the aim of criminal law is to minimize the social costs, which is the sum of three things:

   (1) the social cost of the crimes that are committed,
   (2) the cost of detection, and
   (3) the cost of trying and punishing the offenders who get caught.

   Suppose that each crime cost the city of Madison $5,000 worth of harm. The current police force costs $1,000,000 and it apprehends 30% of offenders. The total social cost of trials and punishment is $50,000 per criminal caught. Each year 1,000 crimes are committed.

   (a) Calculate the social cost of crimes committed.

   $$\begin{aligned}\text{Social cost of crimes committed} &= \text{number of crimes} \times \text{cost per crime} \\ &= 1,000 \times 5,000 = 5,000,000\end{aligned}$$

   Hence, social cost of crimes committed = $5,000,000

   (b) Calculate the cost of trying and punishing offenders.

   $$\begin{aligned}&\text{Cost of trying and punishing offenders} \\ &= \text{Number of criminals caught} \times \text{Cost of trying and punishing each offender} \\ &= [Pr(\text{criminals being caught}) \times \text{Number of crimes}] \times 50,000 \\ &= [.3 \times 1000] \times 50,000 \\ &= 300 \times 50,000 = 15,000,000\end{aligned}$$

   Hence, cost of trying and punishing offenders = $15,000,000

   (c) What is the social costs?

   $$\text{Social costs} = 5,000,000 + 1,000,000 + 15,000,000 = 21,000,000$$

   So social cost = $21,000,000

   The city of Madison is considering measures to reduce the impact of crimes. Two measures were proposed. Proposal 1 aims to expand the police force to increase detection of criminals. This would raise the cost of maintaining the police force to $4,000,000 and increase the rate of detection to 40%. This measure would also decrease the number of crimes committed to 600 per year.

   (d) Calculate the social cost of crimes committed under Proposal 1.

   $$\begin{aligned}\text{Social cost of crimes committed} &= \text{number of crimes} \times \text{cost per crime} \\ &= 600 \times 5,000 = 3,000,000\end{aligned}$$

   Under proposal 1, social cost of crimes committed = $3,000,000

   (e) Calculate the cost of trying and punishing offenders under Proposal 1.

   $$\begin{aligned}&\text{Cost of trying and punishing offenders} \\ &= \text{Number of criminals caught} \times \text{Cost of trying and punishing each offender}\end{aligned}$$

$$
\begin{aligned}
&= [Pr(\text{criminals being caught}) \times \text{Number of crimes}] \times 50,000 \\
&= [.4 \times 600] \times 50,000 \\
&= 240 \times 50,000 = 12,000,000
\end{aligned}
$$

Under proposal 1, cost of trying and punishing offenders = $12,000,000

(f) What is the social costs under proposal 1?

$$\text{Social costs} = 3,000,000 + 4,000,000 + 12,000,000 = 19,000,000$$

So social cost under proposal 1 = $19,000,000

Proposal 2 aims to increase the prison sentence to deter potential offenders from committing crimes. This would raise the cost of trying and punishing offenders to $100,000 per criminal caught. This measure would also decrease the number of crimes committed to 700 per year.

(g) Calculate the social cost of crimes committed under Proposal 2.

$$
\begin{aligned}
\text{Social cost of crimes committed} &= \text{number of crimes} \times \text{cost per crime} \\
&= 700 \times 5,000 = 3,500,000
\end{aligned}
$$

Under proposal 2, social cost of crimes committed = $3,500,000

(h) Calculate the cost of trying and punishing offenders under Proposal 2.

$$
\begin{aligned}
&\text{Cost of trying and punishing offenders} \\
&= \text{Number of criminals caught} \times \text{Cost of trying and punishing each offender} \\
&= [Pr(\text{criminals being caught}) \times \text{Number of crimes}] \times 50,000 \\
&= [.3 \times 700] \times 100,000 \\
&= 210 \times 100,000 = 21,000,000
\end{aligned}
$$

Under proposal 2, cost of trying and punishing offenders = $21,000,000

(i) What is the social costs under proposal 2?

$$\text{Social costs} = 3,500,000 + 1,000,000 + 21,000,000 = 25,500,000$$

So social cost under proposal 2 = $25,500,000

(j) Which proposal would the city of Madison favor?

Proposal 1, since it results in the smallest total cost to the society out of the three options (keep the current system, Proposal 1 and Proposal 2).

2. (From Miceli (2004): Chapter 9)

   Consider fines for speeding. Assume that speeders can drive at either 75 mph or 90 mph (the speed limit is 65 mph), and that the probability of being caught at either speed is .01. Also, assume that the maximum possible fine is $10,000, which is set for driving at 90 mph.

   (a) Suppose an individual has already decided to speed. Calculate the fine for driving at 75 mph that will discourage her from increasing her speed to 90 mph unless her gain from doing so is $50 or more.

   The expected fine for driving at 90 mph is $(.01)(\$10,000) = \$100$. In order to achieve the desired level of marginal deterrence, the expected fine for driving 75 mph must be less than this amount by $50, the efficient threshold for driving at the higher speed (in other words, the increase in expected punishment must equal to $50, so that people with gains of $50 or more from increasing speeding to 90 mph will find their gains outweigh the costs). Thus,

$$\$100 - (.01)(f_{75}) = \$50$$

   Solving yields $f_{75} = \$50/.01 = \$5,000$.

   (b) Show that the same degree of marginal deterrence can be achieved by setting the fine at $10,000 for driving at either speed but pulling over those driving at 90 mph more frequently.

   Marginal deterrence can also be achieved by adjusting the probability of apprehension rather than the fine. Thus, set the fine for both offenses at $10,000 and assume that the probability of apprehension for driving at 75 mph continues to be .01.

   As in part (a), the expected fines must differ by $50, so the optimal probability of apprehension for driving at 90 solves

$$(p_{90})(\$10,000) - (.01)(\$10,000) = \$50$$

   Solving yields $p_{90} = 0.015$.