

# **Lecture #9**

## **Law and Economics**

# Law from an Economist's Viewpoint

- § Coase theorem sounds optimistic...
- § in practice, though, it's based on strong assumptions
- § functions of the law:
  - § defining property rights – concerning assets, resources, etc.
  - § lowering transaction costs
  - § ensuring contract enforcement
- § externalities, asymmetric information – the need for providing non-market incentives for appropriate behavior (cf. Hobbes)
  - § e.g. tickets for speeding

# Crime and punishment: an economic approach

§  $x$  – the level of a forbidden (criminal) activity

§  $C(x)$  – the cost of its “production”

§  $B(x)$  – benefit for the “producer”

§ profit:  $B(x) - C(x)$

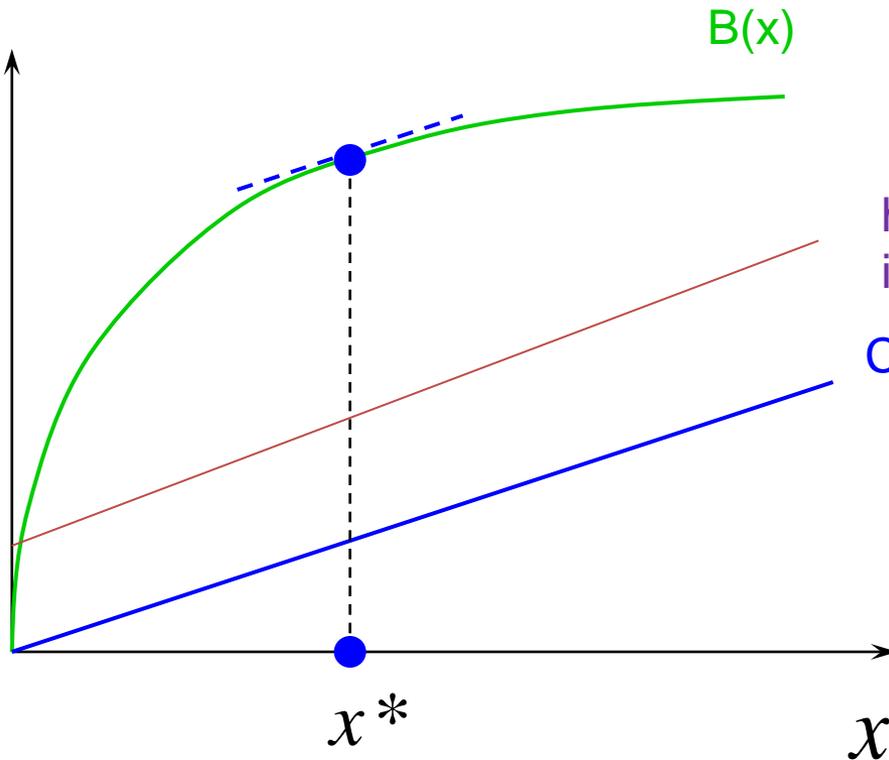
§ What is the rational level of  $x$ ?

# Crime and punishment

§ objective:  $\max B(x) - C(x)$

§ first-order condition:

$$B'(x) = C'(x)$$

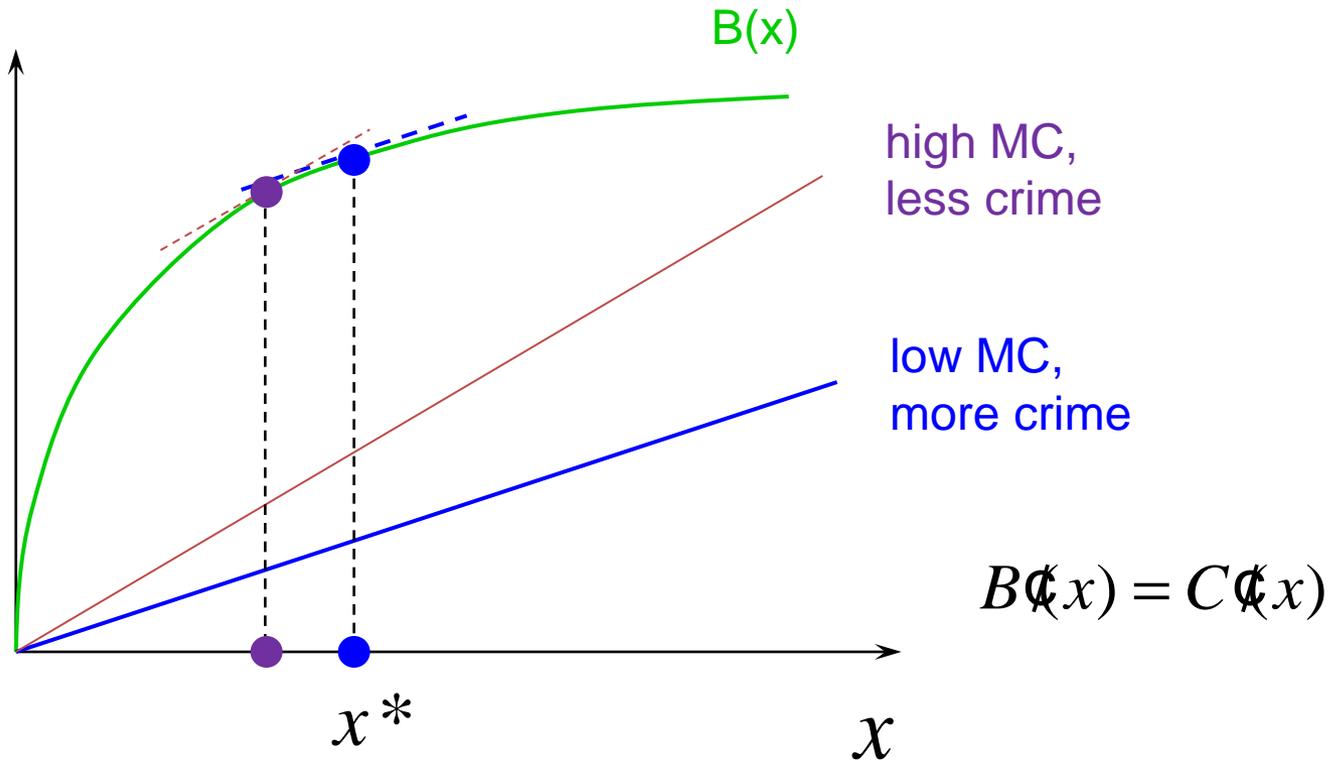


higher  $C(x)$ , MC the same –  
identical level of criminal activity

$$B(x^*) = C(x^*)$$

# Crime and punishment

Higher **marginal** costs reduce crime



# Crime and punishment

§ in practice detecting a crime is uncertain

§ it depends on effort (e.g. police efforts),  $e$

§ probability of detection:

$$p(e)=0 \text{ for } e=0$$

$$p'(e)>0$$

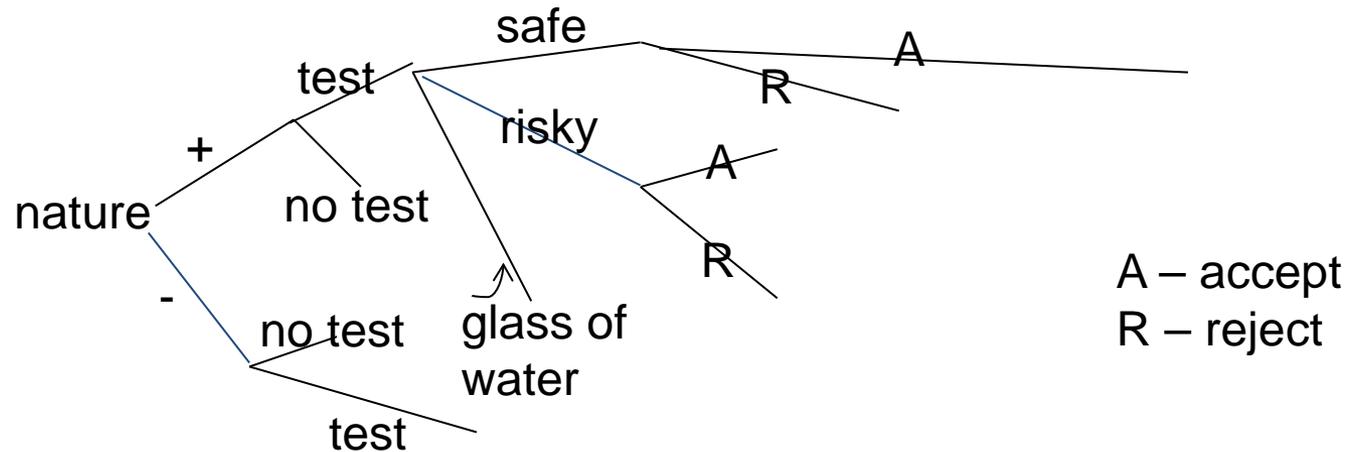
# Crime and punishment

- § both higher punishment and increased police activity deter from committing crime
- § what will be better for the society – strict punishment or better detection?
- § it depends on the costs
  - § increasing detection rates is usually very costly
  - § imprisonment is a very costly punishment from the society's point of view
  - § actually it is also so for capital punishment (court fees!)
  - § fines are cheap

# **Punishment for effects or risk: the case of criminal transmission of HIV**

- § the case of Simon Mol: born in Cameroon, poet, journalist, a supposed political refugee, Antifascist of the Year 2003 in Poland, consciously infected at least 16 Polish women with HIV
- § how to optimally punish for such crimes?
- § should the law treat exposure to risk of infection in the same way as actual infection?
- § should the law treat conscious (deliberate) infection (i.e. when one of the partners knows that he/she is infected) in the same way as a not-completely-conscious infection (i.e. when one of the partners supposes that he/she can be infected)?

# Francis and Mialon (2008): The Optimal Penalty for Sexually Transmitting HIV



- § in a socially-optimal equilibrium those potentially infected take a test and propose only safe sex or no sex whenever the test result is positive
- § those who know that they are not infected propose risky sex

## HIV – contd.

- § Signalling: a proposal of risky sex compared with “safe” sex is more costly for an infected person *provided that the law treats actual infection stricter than exposure to the risk of infection*
- § (in reality law in many countries currently treats both cases identically, thereby giving weak incentives for safe sex)
- § the law should give incentives to take tests for HIV
- § (in reality the law usually punishes for *conscious* exposure giving thereby incentives to *avoid* tests)

# Damages

§ injurer IN, victim V

§ (e.g. employer-employee, producer-consumer, physician-patient etc.)

§ IN's effort to avoid costly accident:  $x$

§  $C(x)$  – cost of effort,  $c'(x) > 0$

§  $L(x)$  – expected costs of accident,  $L'(x) < 0$

§ social objective:  $\min_x C(x) + L(x)$

§ therefore:  $c'(x^*) = -L'(x^*)$

§ so the private marginal cost of limiting the negative effects (damages caused by an accident) must be equal to the marginal benefits

# Rules concerning damages

§ consider different rules:

§ no liability rule

§ strict liability rule

§ negligence rule

## Effects of different rules

- § no liability: no incentives to undertake effort,  $x=0$ , too many accidents
- § strict liability rule: IN minimizes joint costs  $C(x)+L(x)$ , thus chooses optimal  $x^*$   
(note: this is true only because V cannot influence  $L$ . In reality this rule may lead to inefficient behavior of V)
- § negligence rule is optimal only if  $x < x^*$  is punished (there is a risk of misspecifying the level of  $x$  in the legal norm)

# Accidents depending on effort of both parties

§ assume that both V and IN can influence the expected damage resulting from an accident

§ e.g. despite alarming symptoms a patient does not seek advice of a physician, a construction worker does not wear a protective hat etc.

§ (cf. Article 462 of the Polish civil code)

§  $C_V(X_V)$  and  $C_{IN}(X_{IN})$  result in damage  $L(X_V, X_{IN})$

§ society's objective:

$$\min_{X_V, X_{IN}} C_V(X_V) + C_{IN}(X_{IN}) + L(X_V, X_{IN})$$

## Effort of both parties – contd.

$$\min_{X_V, X_{IN}} C_V(X_V) + C_{IN}(X_{IN}) + L(X_V, X_{IN})$$

§ social optimum when marginal costs of V's and IN's effort are equal to marginal benefits

§ so we have:

$$C'_V(X^*_V) = -\partial L(X^*_V, X^*_V) / \partial X_V$$
$$C'_{IN}(X^*_{IN}) = -\partial L(X^*_V, X^*_V) / \partial X_{IN}$$

## Effort of both parties – contd.

- § under “no liability” each of the parties will only be concerned with its own costs and benefits, thus  $X_{IN}$  will be too low
- § under strict liability, the victim will not have incentives to undertake effort,  $X_V=0$
- § both cases result in inefficiency

## Effort of both parties – partial compensation

§ IN must bear the costs of part of the damage, e.g.  $f$

§ IN will minimize  $C_{IN}(X_{IN}) + fL(X_V, X_{IN})$ .

§ thus IN will choose an effort level fulfilling:

$$C'_{IN}(X_{IN}) = -f \frac{\partial L(X_V, X_{IN})}{\partial X_{IN}}$$

§ whereas social optimum requires:

$$C'_{IN}(X_{IN}) = - \frac{\partial L(X_V, X_{IN})}{\partial X_{IN}}$$

§ thus, with  $f < 1$ ,  $X_{IN}$  is too low

## Effort of both parties – negligence rule

- § IN is liable for all of the damage if and only if his/her effort is lower than the socially-optimal level
- § thus IN will choose an effort level at the socially-optimal level
- § V will be liable for all of the damage. Thus he/she will also choose a socially-optimal effort level
- § alternatively: the law can also stipulate that IN is liable unless V chose an effort level which is lower than the socially-optimal one (contributory negligence)

# Antitrust (competition law)

- § US antitrust law allows to seek triple damages in the case of collusion (“treble damages”)
- § in Poland Article 415 of the civil code allows only to seek compensation limited by the damage level, while Article 15 of the Counteracting Unfair Competition Act allows to seek additionally the benefits gained by the colluding party (however, generally this only concerns obstructing market entry)
- § consider collusion in a market for a good produced at a constant unit cost  $c$
- § let  $x(p)$  denote demand
- § the cartel maximizes profits:  $\max_p \pi = (p - c)x(p)$
- §  $p=p^m$  and  $x^m=x(p^m)$ .

# Antitrust

§ let  $D(p)$  denote damages incurred by V

§ denote the probability of winning the case against the cartel by  $\rho$

§ if the cartel loses the cases, it pays out  $\gamma D(p)$

§ now the cartel maximizes:

$$\max_p \pi = (p - c)x(p) - \rho\gamma D(p).$$

§ in general, it will now set a different (usually lower) price

§ however, in a special case when  $D(p) = \pi$ , the price will not change (just like a neutral tax)

# Antitrust and consumer rent seeking

§ the consumer takes into account the possibility of a claim

§ he/she has an additional incentive to consume, what increases the cartel's profit, which can perhaps be snatched!

§ assume quasi-linear preferences:

$$u(x) + m - px$$

§ it is possible to obtain an expected compensation (damages) of:

$$E(D) = \rho\gamma(p - c)x$$

§ consumer's objective function:

$$\max_x u(x) + m - px + \rho\gamma(p - c)x$$

# Antitrust+rent-seeking: efficient price

§ consumer's objective function:

$$\max_x u(x) + m - px + \rho\gamma(p - c)x$$

§ we can rewrite it in this way:

$$\max_x u(x) + m - \underbrace{[p - \rho\gamma(p - c)]x}$$

§ for both parties  $p^e$  plays exactly the same role as the ordinary price earlier

efficient price  $p^e$

§ thus we will have  $p^e = p^m$

§ because  $p^e$  includes the possibility of a claim, the nominal price is higher than  $p^m$ . Antitrust regulation results in (seemingly) higher prices.