Introduction to Law and Economics
Tort Law: Liability and Deterrence

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Tort Law

- People often do things that harm others (think about externalities!).
- Some are intentional, some unintentional.
- The former overlaps with criminal law, which we skip.
- Here we concentrate on the unintentional, i.e., accidents.
- Many of the possible harms can be negotiated between parties. In that case, contract and property laws regulate them. Also, Coase Theorem broadly applies.

Tort Law

- In many cases, the transaction cost is so hight that negotiation between parties is impossible in advance: This means Coase Theorem does not apply!
- For example, car accidents between strangers.
- When transaction cost is high, tort law allocates liability to internalize the cost of harms.

Tort Law

- Tort Law governs the wrongs (and compensations) that do not arise from breath of contract and cannot be remedies by an injunction against the future.

- Two main ingredients:
  (1) Who is at fault or, more generally, to what extent is each party liable for the loss? (Liability; 責任)
  (2) How much to compensate, if any? (Damages; 損害賠償)

Basic Tort Theory

- If a plaintiff is suing for tort compensation, three elements must be presented:

  (i) Harm: no harm no suit, and therefore no compensation.
  Even if the victim is exposed to hazard (risk), as long as there is no harm, there is no compensation.

  (ii) Cause: the defendant's action (or inaction) must be the cause of plaintiff's loss.

      (a) But what is "cause"? The "but-for" test.

      (b) Proximity of cause.

      (c) See Palsgraf v. Long Island Railroad Co. for case study.

Basic Tort Theory

(iii) Liability: defendant must be shown to breach certain legal duty:

    (a) In certain situation, only (i) and (ii) are enough to render the defendant liable. This is called strict liability (嚴格責任).

    (b) In most situations, the defendant must also be shown to break certain legal obligation; that is, to be negligent (有過失) for certain legal standard (called "due care"). This is the negligence rule.

    (c) Under the simple negligence rule, the defendant is liable if and only if he is negligent of due care.

Basic Tort Theory

- There is either theory or important (US) precedents for each of three elements (damages, causality, liability) mentioned above. We will discuss them one by one. First, liability.

Liability: Contributory Negligence and Comparative Negligence

- What if both plaintiff (P) and defendant (D) contribute to injuries?
- For example, a pedestrian walks on red, and is hit by a speeding driver.
  - (c') Two variations of negligence rule:
    1. Contributory negligence (與有過失): Defendant is liable if, and only if, the plaintiff has exercised due care.
    2. Comparative negligence: To compare, and share, the liabilities between all parties involved.

Liability: Contributory Negligence and Comparative Negligence

- Contributory negligence says that, when P "contributes" to the injury, he cannot recover loss.
- Contributory negligence obviously aims for the "last clear chance" to avoid accident.

Liability: Contributory Negligence and Comparative Negligence

- Contributory negligence, being "all-or-nothing" in nature, is therefore a defense of a negligence claim against P. The defendant, when proved of being negligent, always seeks to show that P contributes to the injury.
- This defense is not available for tortfeasors whose conduct amounts to malicious or intentional wrongdoing.

Liability: Contributory Negligence and Comparative Negligence

- Contributory negligence is sometimes unfair as, for example, D escapes liability even if P is shown to be responsible for only 1% of injury.

- A modification of contributory negligence is the comparative negligence.

- Comparative negligence attempts to allocate responsibility (and therefore compensation) between P and D, and among Ds if there is multiple tortfeasor.

Liability: Contributory Negligence and Comparative Negligence

- Two forms of comparative negligence:
  - (i) Pure comparative negligence: Each actor shares his portion of liability. For example, if injury is $100, in which P is 20% negligent, and D1 and D2 are 30% and 50%, respectively. Then P can recover only $80, with $30 ($50) from D1 (D2).
  - (ii) Modified comparative negligence: P is compensated the full injury if his liability is no greater than 50%, and nothing if greater than.

Liability: Contributory Negligence and Comparative Negligence

- Prior to late 1960s, only a few US states adopted comparative negligence. Now most US states have it.

- Alabama, Maryland, North Carolina, and Virginia still adopt contributory negligence.

- Li v. Yellow Cab Co. (a California supreme court case, 1975) and Hoffman v. Jones (a Florida supreme court case, 1973) are widely believed to be the precedents in adopting comparative advantage.

- In Taiwan, comparative negligence is the norm.

Liability: Critics of Comparative Negligence

- Comparative negligence obviously can improve efficiency over contributory negligence. However, it is not perfect when, for example, some D is judgement proof.
- Not all responsible parties are brought to court.
- Hard to assess percentage of fault.
- Contradicts doctrine of last clear chance.

Liability: A Prototype Model of Accident

- Throughout, we consider a simple setting in which an accident involves two parties: motorist (injurer) and pedestrian (victim).

- The probability of accident (or damage caused) depends on the <u>care</u> of either motorist or pedestrian, or both.

- Motorist (or pedestrian) faces liability, therefore rule of liability affects behaviour of both motorist and pedestrian.

- The goal of policy maker is to allocate liability in such a way that it maximizes social welfare which, in this case, is equivalent to minimizing total social loss, which equals to the cost of care plus expected loss of accident.

Types of Liability

- In the simplest setting, assume the probability of accident depends only on motorist's care.

- In this case, strict liability with contributory negligence rule does not apply; simple negligence rule is the same as negligence with contributory negligence.

- Strict liability (嚴格責任): Motorist is responsible for all losses they cause.

- Simple negligence rule (過失責任): Motorist is responsible only if he is *negligent* (有過失), in the sense that his level of care is lower than a level called *due care* (應有的注意).

- No Liability: Motorist is not liable regardless of care.

Case when Only Injurer's Care Affects Probability of Accident: One-Sided Precaution

care level	cost	Probability of accident	expected loss	total social cost
0 (none)	0	0.20	20	20
1 (moderate)	8	0.10	10	18
2 (high)	12	0.07	7	19

The loss of the accident is 100.

- The social optimal: moderate care.
- What type of liability rule facilitates optimum?

Different Liability Rules

- Rule of no liability: Motorist will not exercise any care.

- Strict liability: Forces the motorist to internalize all costs. Facilitates optimum. This is actually the Pigou tax.

- Rule of simple negligence: Motorist is liability if, and only if, his care level is less than due care level set by law.

- When the motorist's care level alone affects probability of accident, strict liability always results in optimum. (Proof in next page.)

Some Math: Strict Liability

- Let e be the care level, and L the loss of accident.
- Let $p(e)$ be the probability of accident, when care level is e.
- Let $c(e)$ be the cost of effort level e.
- The total expected social loss is then $p(e)L + c(e)$.
- Suppose e^* is the socially optimal care level. That is,
  $p(e^*)L + c(e^*) < p(e)L + c(e)$ for all $e \neq e^*$

Some Math: Strict Liability

- Lesson 0: If only driver's care level affects the probability of accident, then strict liability is an optimal liability rule.
  Proof: The expected loss of the driver, when his care level is e, is

$$p(e)L + c(e) \equiv Z(e);$$

But $Z(e)$ is exactly the expected social loss as a function of his care level. Therefore, when he is choosing a care level e to minimize $Z(e)$, he is actually minimizing expected social loss, and his choice must be e^*. QED

Simple Negligence Rule

- Simple negligence rule: Three possibilities, depending on how the authority sets the level of due care.
    - (i) If due care is 0: Equivalent to no liability. Not optimal.

Simple Negligence Rule

(ii) If due care level is 1: Motorist is not liable only if he exercises at least moderate care. His expected cost:

care level	cost of care	Probability of accident	expected liability	Motorist's total cost
0	0	0.20	20	20
1	8	0.10	0	8
2	12	0.07	0	12

The motorist will exercise moderate level of care. Optimal.

Simple Negligence Rule

(iii) If due cared level is 2: Motorist is not liable only if he exercises high care level.

care level	cost of care	Probability of accident	expected liability	Motorist's total cost
0	0	0.20	20	20
1	8	0.10	10	18
2	12	0.07	0	12

The motorist will exercise high level of care. Not optimal.

Simple Negligence Rule

- Social optimum attains if due care is set at moderate level.

- Lesson 1: The optimal level of care will be exercised if, under negligence rule, the due care is set at the level corresponding to the socially optimal care level. That is, motorist is not liable if and only if he exercises a care level equal to (or greater than) the socially optimal care level.

- This lesson is true not only in this example, but also in general. See proof in next page.

Simple Negligence Rule: Math

- Want to show: Motorist will choose e^* under negligence rule, if due care is set at e^*.

  Proof: Obviously, the motorist will not choose an effort level $e > e^*$. For this only increases his cost of care without affecting liability.

  For any effort level $e < e^*$, $p(e^*)L + c(e^*) < p(e)L + c(e)$ by definition of optimality of e^*.

  This implies that $c(e^*) < p(e)L + c(e)$. The left-hand side is exactly the injurer's loss when he choose care level e^*; and the right-hand side is his expected loss when he choose $e < e^*$. Therefore, e^* incurs lower cost for him than any $e < e^*$. QED

Comparison of Liability Rules

- Although in our example both strict liability and negligence induce efficiency, in practice they are different.

- Negligence requires the authority both to figure out the optimal care level and the ability to prove whether motorist exercises due care.

- Strict liability, on the other hand, does not require either.

- Lession 2: If only motorist's care influences the probability of accident, strict liability is a better liability rule than negligence rule in practice.

- Example: plane crash.

Comparison of Liability Rules

- In fact, if the probability of accident depends on a single party only (either victim or injurer), that party should be subject to strict liability.

- Proof

  If only the injurer's care level affects probability of accident, then strict liability with full compensation attains social optimum: The injurer's loss is exactly $c(e) + p(e)L$, the expected social loss.

  If only the victim's care level affects probability of accident, then the rule of "no liability" attains social optimum: The victim's loss is exactly $c(e) + p(e)L$, the expected social loss.

  In summary, the damage of accident should soley be bore by the party whose care level affects its probability.
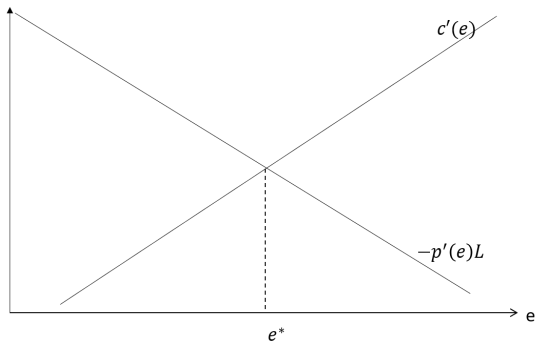
Due Care: One-Sided Precaution

- How should the level of due care be set?

- First consider the case that probability of accident depends only on one side's care level.

- The expected total social loss from accident is

$$c(e) + p(e)L;$$

  where e is care level of either injurer or victim.

- Socially optimum care level determined by

$$c'(e^*) = -p'(e^*)L.$$

- $c'(e)$ is marginal cost of care. $-p'(e)L$ is the marginal benefit of care.

Hand Rule

- In words, the injurer should be liable if his marginal cost of care is smaller than the expected damage that this care can save.

- The efficiency criterion described above is called <u>Hand Rule</u>, from a case called *United States v. Carrroll Towing Co.*

- Simple enough, but what about the case when both parties affect outcome?

- Need game theory.

Due Care Level: Bilateral Precaution

- Let e_v and e_i be the care levels of the victim and injurer, respectively.
- Expected total social loss is

$$c(e_i) + c(e_v) + p(e_i, e_v)L.$$

- Socially optimal care levels, e_i^* and e_p^*, satisfy

$$
\begin{aligned}
c'(e_i^*) &= -p_1(e_i^*, e_v^*)L; \\
c'(e_v^*) &= -p_2(e_i^*, e_v^*)L.
\end{aligned}
\tag{1}
$$

- Equation (1) actually says that optimal care levels of both victim and injurer satisfy Hand Rule.
- It also says that, when the care level of the other party is at its social optimal, one's individual optimal care level is also the social optimal.

Due Care Level: Bilateral Precaution

- As long as $e_i^*, e_v^* > 0$, neither strict liability nor no liability attain social optimum.

- Negligence rule is needed.

- Strict liability and no liability are identical to the case of one-sided precaution.

- Strict liability with defence of contributory negligence: If the pedestrian has taken due care, the motorist is liable.

- Negligence rule with defence of contributory negligence: The motorist has liability only if the pedestrian takes due care and he has not.

A Summary of Various Liability Rules

- Care levels taken by injurer and victim: e_i, e_v.
- Due care levels for injurer and victim: e_i^d, e_v^d.
- Strict liability: Injurer is liable regardless of care levels.
- Rule of no liability: Injurer is not liable regardless of care levels.
- Simple negligence: Injurer is (is not) liable if $e_i < e_i^d$ ($e_i \geq e_i^d$).
- Negligence with a defense of contributory negligence: Injurer is (is not) liable if $e_i < e_i^d$ and $e_v \geq e_v^d$ ($e_i \geq e_i^d$ or $e_v < e_v^d$).
- Strict liability with defense of contributory negligence: Injurer is (is not) liable if $e_v \geq e_v^d$ ($e_v < e_v^d$).

Case when Both Affect the Probability of Accident

- We can show that when due care levels are set at their socially optimal levels, ($e_i^d = e_i^*$ and $e_v^d = e_v^*$), then efficient precaution can be attained by a Nash equilibrium in negligence rule.

- Suffices to show that

  (i) when $e_v = e_v^*$, injurer's expected cost, $c(e_i) + p(e_i, e_v^*)L$, is minimized when $e_i = e_i^*$;

  (ii) when $e_i = e_i^*$, victim's expected cost is minimized when $e_v = e_v^*$.

Case when Both Affect the Probability of Accident

- Suppose $e_v = e_v^*$, then by the definition of efficiency of e_i^*,

$$c(e_i) + c(e_v^*) + p(e_i, e_v^*)L$$
$$> c(e_i^*) + c(e_v^*) + p(e_i^*, e_v^*)L$$

for all $e_i \neq e_i^*$.

- Implying

$$c(e_i) + p(e_i, e_v^*)L > c(e_i^*) + p(e_i^*, e_v^*)L$$

for all $e_i < e_i^*$.

Case when Both Affect the Probability of Accident

- Since the due care level $e_i^d = e_i^*$, under either simple negligence or negligence with a defense of contributory negligence, the expected cost of the injurer is

$$\begin{cases} c(e_i) + p(e_i, e_v^*)L, & \text{if } e_i < e_i^*; \\ c(e_i), & \text{if } e_i \geq e_i^*. \end{cases}$$

- Injurer's expected cost is minimized when $e_i^d = e_i^*$.

- Under strictly liability with defense of contributory negligence, the injurer's expected cost is

$$c(e_i) + p(e_i, e_v^*)L.$$

- From (1), we can see clearly that the injurer's expected cost is minimized when $e_i = e_i^*$.

- Similarly for e_v.

Determination of Damages: Compensatory Damages

- Damages accomplish two goals:
  - (i) Recover the victim's loss to the level before the tortious act.
  - (ii) For the injurer to pay the price of harming the victim.
- The <u>compensatory damages</u> are meant to achieve the two goals simultaneously.
- Some injuries have standard market values, so that compensation can be based on those values. E.g., cars, books, etc.
- Forcing the liable injurer to compensate the full market values achieves efficiency, i.e., it incentivizes the injurer to take efficient care level, given the correct liability rule.

Determination of Damages: Compensatory Damages

- Simple example: Suppose the probability that accident occurs as a function of injurer's care level is $p(e)$, with $p'(e) < 0$. The loss of the accident is L, and injurer's cost of care is $c(e)$, with $c'(e) > 0$.

- The socially optimal care level is one that minimizes expected total social cost
$$p(e)L + c(e).$$

- When the injurer needs to compensate the full value of loss when accident occurs, his expected loss is
$$p(e)L + c(e).$$

Determination of Damages: Compensatory Damages

- Since the injurer's cost is identical to social cost, the injurer's optimal choice of care level must be socially optimal.
- Essentially, full compensation <u>internalizes</u> the externalities of the injurer's actions.
- Mathematically, it is just like the Pigou tax when we covered the Coase Theorem.

Determination of Damages: Compensatory Damages

- Some injuries, however, have no market value. E.g., what is the amount of compensation to recover parents' utility for their child killed in an accident?

- One way to calculate is to figure out how much money people spend to avoid a risk.

- E.g., one might spend up to L to mount a gear in a car which reduces fatal accident by probability p. Let X be the price of life.

Determination of Damages

- That means the price to reduces "expected loss of life", pX, is L, so that $pX = L$, and $X = L/p$.

- Therefore, the injurer compensates the amount L/p when his wrongful act causes a death.

- This is a Hand Rule-like damages.

Punitive Damages (懲罰性賠償)

- Punitive Damages : In addition to compensating victim's loss, court or jury usually impose punitive damages.
- The US experience shows that punitive damages lack clear guide line, are highly unpredictable, and are feared especially by defending firms. (See Liebeck v. MacDonald's)
- Why punitive damages, and how should it be determined?
- One reason is that legal enforcement is not perfect.
- As shown above, forcing injurer to fully compensate victim's loss can attain efficiency. In reality, not all injuries are conpensated (either because of enforcement error or litigation cost).

Punitive Damages: Example

- Suppose the cost of care is \$500. If injurer exercises care, the probability of accident is 0, and is 0.2 if not. The victims's loss, when accident occurs, is \$3,000. It is socially efficient for injurer to exercise care: $\$500 < 0.2 \times \$3,000$: injurer won't exercise care even if it is socially optimal.

- Suppose error occurs with probability 0.4, so that an injurer who is negligent is held so in court only with probability 0.6. Then $\$500 > 0.2 \times 0.6 \times \$3,000$.

- When there is enforcement error, injurer will not exercise care when it should be efficient to.

Punitive Damages: Example

- If the probability of legal error is commonly known, the court can impose punitive damages which equal to $0.4 \times \$3,000$, thereby forcing the injurer to take it into consideration.

- In general, suppose the probability of enforcement error is p and loss of accident is L, and the level of punitive damages is D.

- To recover efficiency, D should be set in a way that

$$(1-p)(L+D) + p \cdot 0 = L,$$

  so that $D = \frac{p}{(1-p)}L$.

- As long as there is error, i.e., $p < 1$, D is greater than 0.

Punitive Damages: Example

- We have so far covered two of the three ingredients of burden of persuasion, liability and damages. The third ingredient causality, will be covered in a case study of Palsgraf v. Long Island Railroad Co.