Dis 8: Tort Law (Cont'd) [†]

1 Accidents Involving Businesses

- **How do firms set prices?**

  Under perfect competition, $p = MC$ (marginal revenue = marginal costs)

  Potential sources of MC:

  - Marginal operational costs
    (Sell one more unit, how much costs does it incur to seller in production)
  - Marginal costs on precaution
    (Sell one more unit, how much costs incurred on this unit on precaution)
  - Expected marginal costs for bearing damages
    (If the firm bears liability, what's the expected costs (i.e. probability of harm $\times$ amount of harm, under perfect compensation) per unit sold for bearing damages)

- **Accidents between sellers and strangers**

  Here, the injurer is a competitive business, but it doesn't do business with the victim.

	Injurer's Precaution	**Injurer's Activity**
Strict liability	Efficient	Efficient
Simple negligence	Efficient	**Too high**

- **Accidents between sellers and customers**

  Here, the injurer is a competitive business, and the victim is its customer.

	Victim's Risk Perception	**Injurer's Precaution**	**Victim's Activity**
Strict liability	Yes	Efficient	Efficient
	No	Efficient	Efficient
Simple negligence	Yes	Efficient	Efficient
	No	Efficient	**Too high**
No liability	Yes	Efficient	Efficient
	On Average	**None**	Efficient
	No	**None**	**Too high**

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

2 Deviating from Our Model

- **Effects of Errors**
  - **Types of errors**
    - **Random mistakes (uncertainty)**: Damages / level of due care may be incorrect in specific cases, but are correct on average.
    - **Systematic mistakes (errors)**: Damages / level of due care are skewed either too high or too low on average.
  - **How do errors affect incentives?**
    - Under a strict liability rule,
      - Random errors in setting damages have no effect on injurer's incentives.
      - Systematic errors in setting damages will skew the injurer's incentives in the same direction.
    - Under a simple negligence rule,
      - Small errors, random or systematic, in setting damages have no effect on injurer's incentives for how much precaution to take.
      - Large random errors in the legal standard of care lead to more precaution.
      - Large systematic errors in the legal standard of care skew the injurer's incentives of taking precaution in the same direction.
- **Relaxing model assumptions**
  - **Rationality**: Agents act to maximize their expected utility (subject to consistent risk-preferences) based on accurate assessments of risks.

    Objection: Two objections to rationality:
    - Risk perception: People systematically misperceive the value of probabilistic events: overestimating exotic risks and underestimating mundane risks.
    - Risk preferences: People are willing to take small-probability gambles, but not proportional larger-probability gambles.
  - **Full damage payment**: Damages are paid in full, and so injurers fully internalize the value of all harms.

    Objection: Agents are often liquidity-constrained and incapable of paying damages in full (what we refer to as "*judgment-proof*").
  - **No regulations**: There are no regulations in place on level of precaution to take. Our only source of incentive for taking precaution comes from liability rules.

    Objection: Regulations are ubiquitous, and often do better than tort liability (ex. judgement-proof injurers; small harms to many parties).
  - **No insurance**: Insurance cannot be purchased to protect from risks, and so involved parties bear the cost of accidents.

    Objection: Insurance partially protects involved parties from the cost of accidents, but this can reduce the incentives to take precaution created by liability rules (what we refer to as "*moral hazard*").
  - **Costless litigation**: There are no costs (explicit or opportunity costs) from taking claims to court.

Objection: Costly litigation reduces victims' incentives to bring suits and increases expected costs to potential injurers. Further, the rules about who bears the cost of litigation creates incentives of its own (ex. the incentive to bring "frivolous" suits designed to elicit out-of-court settlement).

- **Informed citizens**: Parties have perfect knowledge of the laws which affect them.

  Objection: There are numerous laws and parties are often unaware of them, and instead act in accordance with social norms.

- **Vicarious liability**: One party is held liable for the harm caused by another.
  - Concept of **respondeat superior** – "Let the master answer"

    Parents liable for torts of their children.

    Employer liable for torts of employee if employee was acting within the scope of employment.
  - Can be implemented through
    - **Strict liability**: Parent / employer is liable for any harm caused their child / employee. (For the employer case, we still assume that the accident occurred while employee was acting within the scope of employment.)
    - **Negligence**: Employer is only liable if employer was negligent in supervising employee; parent are only liable if parent was negligent in raising / supervising their child.

3 Problems

1. (From sample exam questions)

   Recall the skydiving scenario from your homework this week – The cost of running a skydiving business is \$150 per customer without any precaution; precaution costs the skydive operator \$100 per customer, and reduces the chance of a \$30,000 injury from 1 in 100 to 1 in 300.

   But now, suppose there is just one skydive operator, and he has only \$9,000 in assets. After paying \$9,000, he would be bankrupt, and thus avoid paying further damages. This is referred to as being *judgment-proof*.

   Suppose customers cannot observe the level of precaution taken, and do not suspect the operator is judgment-proof.

   (a) Calculate the damages the operator expects to pay per customer under a strict liability rule if he takes precaution, and if he does not. What level of precaution would a strict liability rule lead to?

   Since the operator is judgment-proof, when accident happens, the operator doesn't bear the full \$30,000 amount of harm. Instead, the operator only pays damages up to its asset level \$9,000.

   Hence, under a strict liability rule, damages that the operator is expected to pay ...

   - ...when the operator takes precaution $= \frac{1}{300} \times 9000 = 30$
   - ...when the operator doesn't take precaution $= \frac{1}{100} \times 9000 = 90$

   Total costs to the operator now becomes

   - Take precaution: $150 + 100 + 30 = 280$
   - No precaution: $150 + 0 + 90 = 240$

   Since it's cheaper for the operator to take no precaution, the operator will choose to take no precaution under a strict liability rule.

   (b) Calculate the damages the operator expects to pay per customer under a simple negligence rule if he takes precaution, and if he does not. (Assume that anything less than the efficient level of precaution would constitute negligence.) What level of precaution would a simple negligence rule lead to?

   We first need to figure out the efficient level of precaution. To do this, let's look at the social costs (SC) under taking precaution or not (social benefits in these cases can be normalized to 0, so we only need to evaluate social costs):

   - $SC(\text{take precaution}) = 150 + 100 + \frac{1}{300} \times 30000 = 350$
   - $SC(\text{no precaution}) = 150 + 0 + \frac{1}{100} \times 30000 = 450$

   Taking precaution results in lower social costs, so taking precaution is efficient. Hence, for the operator to be considered as not negligent, they need to take precaution.

   Since the operator is still judgment-proof, when accidents happens and the operator is liable, the amount paid by operator is still \$9,000 only. So, under a simple negligence rule, the amount of damages that operator is expected to pay ...

   - ...when the operator takes precaution $= 0$
   - ...when the operator doesn't take precaution $= \frac{1}{100} \times 9000 = 90$

   Total costs to the operator now becomes

- Take precaution: $150 + 100 + 0 = 250$
- No precaution: $150 + 0 + 90 = 240$

Again, since it's cheaper for the operator to take no precaution, the operator will choose to take no precaution under a simple negligence rule.

(c) A different way to encourage precaution is through safety regulation. Imagine a government agency which calculates the efficient level of precaution for skydiving operators, conducts periodic inspections, and assesses substantial fines (say, $3,000) when these precautions are not being taken. Explain the following passage from Cooter and Ulen:

"In those industries where undercapitalized firms risk bankruptcy, safety regulations have an advantage over liability. By collecting fines before an accident occurs, officials can force an undercapitalized firm to comply with safety standards that it would violate if the only sanction were liability."

Parts (a) and (b) show that liability alone is not enough to get the operator to take precaution. However, if the operator had a reasonable chance of being fined $3,000 for not taking precaution even when an accident does not occur, it would be in his interest to take precaution (since the total costs of taking precaution to the operator is at most $280, assuming that they bear the liability, which is still way cheaper than the $3,000 fine + any costs from business operation from non-compliance of the safety regulation).

2. Suppose you are driving to Milwaukee. You know that you will be judged as being negligent if you are involved in a crash and the police determine that you were speeding at the time, but such a determination is necessarily imprecise. However, you know that the faster you are going, the greater the risk of hitting someone.

   You know that

   - There is a 75% chance that the threshold for proving in court that you were speeding is the speed limit;
   - There is a 10% chance that the threshold for proving in court that you were speeding is 5 mph over the speed limit;
   - There is a 15% chance that the threshold for proving in court that you were speeding is 10 mph over the speed limit;

   Relative to going 75 mph, every v mph slower you go costs you \$4v, but it also lowers probability of a crash to $\frac{(10-v)^2}{10000}$.

   If you hit someone, it will destroy \$10000 of value; you will have to pay this amount in damages if you are found to be negligent.

   (a) What is the efficient speed?

   Normalize social benefits at each speed (i.e. Getting to Milwaukee safely without any accident) to 0. Hence, we only need to minimize social costs in determining what speed is efficient.

   Social costs when you go v mph slower than 75 mph is

$$4v + \frac{(10-v)^2}{10000} \times 10000 = 4v + (10-v)^2$$

   To minimize social costs, notice that the social costs expression is convex ($\frac{\partial^2[4v+(10-v)^2]}{(\partial v)^2} = 2 > 0$), so we can find the minimizer by taking first order condition (FOC):

$$\begin{aligned} \frac{\partial}{\partial v}\left[4v + (10-v)^2\right] = 4 - 2(10-v) &= 0 \\ 10 - v &= 2 \\ v &= 8 \end{aligned}$$

   (Notice that $v = 8$ is still within the range of possible probabilities that we can have, since when $v = 8$, probability of a crash is still a positive number between 0 to 1.)

   Thus, the efficient speed is to go 8 mph slower than 75 mph. In other words, the efficient speed is $75 - 8 = 67$ mph.

   (b) What would be the legal speed limit if we wanted the expected negligence threshold to be equal to the efficient speed?

   Let x be the speed limit. Then we can write the expected negligence threshold as:

$$(.75)x + (.1)(x+5) + (.15)(x+10) = x + 2$$

   Set $x + 2 = 67$, we found that the speed limit we want to set is 65 mph.

   (c) At the speed limit determined in (b), which speed will you be willing to drive at, the speed limit, the efficient speed, or 75 mph?

When I drive at the speed limit (65 mph), the probability that the court will find me speeding is 75%.

When I drive at the efficient speed (67 mph), the probability that the court will find me speeding is 75% (I'll only be found speeding if the court uses the speed limit as the threshold).

When I drive at 75 mph (which is 10 mph over the speed limit), the probability that the court will find me speeding is 100% (= 75% + 10% + 15%, since regardless of what threshold the court uses, I'll always be found speeding).

Hence, the personal costs for me driving at these two speeds are

- At 65 mph: $4 \times (75 - 65) + .75 \times \frac{(10-(75-65))^2}{10000} \times 10000 = 40$
- At 67 mph: $4 \times (75 - 67) + .75 \times \frac{(10-(75-67))^2}{10000} \times 10000 = 32 + 3 = 35$
- At 75 mph: $4 \times (75 - 75) + 1 \times \frac{(10-(75-75))^2}{10000} \times 10000 = 100$

Clearly, your personal costs are the lowest when you drive at 67 mph, so between these three speed choices, you'll choose to drive at the efficient speed 67 mph.