PROPERTY LAW

Nuisance Remedies

Al owns a shoe factory with noisy machines which disturb his neighbor Bob.

The value of the factory (the present discounted value of its future profits) is $1,000,000. Producing shoes without making noise would be much more costly – if Al were forced to run his factory silently, the value of the factory would fall to $400,000.

It is estimated that the harm done to Bob (having to endure the noise), now and in the future, is worth $100,000.

(a) What is the efficient outcome – for the factory to shut down, to run silently, or to run noisily?

(b) Suppose Bob was granted an injunction to stop the factory from making noise.

      i.   If Bob enforced the injunction, Al would have to run the factory silently. What would be Al's, and Bob's, payoffs?

      ii.   If Al and Bob tried to negotiate to deal under which Bob would not enforce the injunction, what would be each side's threat point during negotiations?

      iii.   If Bob agreed not to enforce the injunction, what would be the gains from cooperation?

      iv.   If the gains from cooperation were split evenly between the two sides, what would each side's payoff be? How much would Al be paying Bob not to enforce the injunction?

(c) Suppose instead that Al were required to pay Bob permanent damages if he wanted to continue making noise. What would Al's, and Bob's, payoffs be?

(d) What does the Coase Theorem say about the two remedies when there are no transaction costs?

(e) Which remedy is more efficient when transaction costs are high and bargaining is unlikely to succeed? Why?

(f) Suppose transaction costs between Al and Bob are high. Explain why temporary damages make it more likely that Al will buy quieter machines in the future, while permanent damages make it more likely Bob will soundproof his house.

Shoveling Snow

In many cities, including Madison, homeowners are responsible for shoveling the sidewalk in front of their house, and can be fined if they do not. My next-door neighbor and I are the same age, equally fit, have equal-sized sidewalks, and value our time about the same. However, after each snowfall, he clears the sidewalk in front of his house with a shovel, and I clear the sidewalk in front of my house with a brand-new, extremely powerful snowblower. Clearing the sidewalk takes me five minutes, and takes him an hour. And I won't lend him my snowblower, because it takes a while to learn how to use it properly and I'm afraid he'd break it.

   (a) If our goal is efficiency, who should clear my neighbor's sidewalk?

   (b) Define the Normative Coase view of how property law should be designed. Under this view, who would end up clearing my neighbor's sidewalk, and why?

Sensing a problem, our neighborhood association proposes a regulation which would require whoever has the newest, most powerful snowblower on each block to clear the sidewalk for the entire block.

   (c) Consider the two rules – the old rule where each homeowner is responsible for his part of the sidewalk, and the new rule where the one with the best snowblower is responsible for the whole block. In the short run – say, for the first week after the neighborhood association meeting – which rule (if either) would be more efficient if transaction costs are low? What if transaction costs are high?

   (d) In the longer term – say, over the course of years – which rule would lead to people owning more advanced snow clearing equipment? Which rule would be more efficient in the long run?

Trees and Neighbors
(Question by Alex Tabarrok, found at www.marginalrevolution.com)

In Virginia, the common law has long held that if a neighbor's tree encroaches on your yard you may cut the branches as they cross the property line, but any damage the tree does to your property is your problem. Your neighbor can even sue if your pruning kills the tree. In 2007, the Virginia Supreme Court overruled this 70 year-old precedent, making it your neighbor's duty to prune or cut down the tree if it is a "nuisance."

Which rule is better: the new rule or the old? What would the Coase Theorem say about the two rules?

Fugitive Property

Pick any example of fugitive property, and explain the tradeoff between assigning ownership via first possession versus tied ownership. (Examples of fugitive property from class include foxes, whales, natural gas, land, and baseballs; you can use any of these, or your own example.)

Eminent Domain and Efficiency

The government is interested in acquiring land to build a school. The school will be a public good, creating $5,000,000 in total value. The land the government wants to build on is currently privately owned.

(a) First, suppose the land is made up of 30 small plots, each one owned by a different owner. Each owner values his own land at $100,000.

      i. Would transaction costs be high or low if the government tried to acquire the needed land through voluntary negotiations?

      ii. Would the government's use of eminent domain to acquire the land be efficient or inefficient?

(b) Now instead, suppose the land is in one piece, and is currently owned by a wealthy retiree. The "fair market value" of the land is $2,000,000, but the retiree has lived on the land his whole life and values it at $10,000,000.

      i. Would transaction costs be high or low if the government tried to acquire the needed land through voluntary negotiations?

      ii. Would the government's use of eminent domain to acquire the land be efficient or inefficient?

Conceptually, eminent domain is similar to using a liability rule (damages), rather than a property rule (injunctions), to protect ownership rights – the government is allowed to take your land and pay you for it, rather than negotiating to buy it from you.

(c) Which type of rule, property or liability, is generally more efficient when transaction costs are high, and which is generally more efficient when transaction costs are low? Given this, is the use of eminent domain more likely to be efficient in the presence of high or low transaction costs? Does this agree with your answers to parts (a) and (b) above?

My Favorite Bar

My favorite bar during graduate school (Antonio's Nut House, for those who know Palo Alto) was occasionally under threat of closing down – every once in a while, a lawyer would move into one of the apartments next door, and threaten to sue for a nuisance injunction due to noise.

The social value of the bar consists of the profits it earns, plus its value to its patrons, minus the inconvenience to the neighbors (and the opportunity cost of the space it takes up). Suppose this social value is negative when the neighbors happen to be people who are unusually sensitive to noise, but positive otherwise.

   (a) Explain the difference between temporary and permanent damages.
   (b) Explain how permanent damages, paid as "a servitude to the land," would solve the problem.
   (c) Who would receive these damage payments if the neighboring homes were owner-occupied? If they were rented? What would the impact be on the value of the homes, or the rent charged to tenants?

What Kind of Person Doesn't Like Jet Skis?

Annabelle and Beth live on opposite sides of a small lake. Annabelle loves peace and quiet. Beth loves to ride her jet ski on the lake, which makes a lot of noise.

There are some times (like early mornings) when Annabelle's disutility from the noise is greater than Beth's value from jet-skiing; there are other times (like weekend afternoons or when Annabelle is out of town) when the reverse is true.

   (a) Suppose there are no transaction costs, and jet skis are ruled to be a nuisance.

      i. If Annabelle is entitled to an injunction preventing Beth from jet-skiing, what outcome would the Coase Theorem predict? How would that outcome be achieved?

      ii. If Annabelle is entitled to be paid damages, what outcome would the Coase Theorem predict? How would that outcome be achieved?

   (b) Now suppose that Beth lived on a larger lake with lots of neighbors. Which remedy, injunctions or damages, is likely to be more efficient? Why?

   (c) Instead of the usual remedies, nuisances like this are often dealt with via regulation: the local authority simply sets a rule as to whether, and under what conditions, jet skis are allowed. This is similar to inalienability – once a regulation has been passed, jet-skiers cannot violate it even if the neighbors agree to let them. Explain why, in settings like Annabelle and Beth's small lake, regulation like this is unlikely to be the most efficient rule.

Interpreting Coase

Consider the following interpretations of the Coase Theorem:

(i)   "The Coase Theorem implies that the boundaries of private property rights are irrelevant. If there are social gains to be had from me raising roosters on my land, then there is some price at which my next-door neighbor will agree to live with the noise."

(ii) "The Coase Theorem implies that zoning laws are unnecessary. If there are social gains to a particular piece of property being a home rather a factory, then there is some price at which a new residential owner, along with his neighbors, would agree to buy the land from the factory owner."

(iii) "The Coase Theorem implies that the details of intellectual property protection are irrelevant. If there are social gains to a patent expiring a year earlier, there is some price that competitors and customers could pay the patentholder to allow infringement. If there are social gains to innovation that might not occur in the absence of patent protection, there is some price society would agree to pay the innovator for the invention."

Do you agree that each of these claims follow from the Coase Theorem? For each one, explain why or why not.

Trees Versus Solar Panels

Richard Treanor and Carolynn Bissett, of Sunnyvale, California, planted several redwood trees on their property between 1997 and 2000. In 2001, their neighbor, Mark Vargas, installed solar panels on his roof, and then complained that the trees blocked the sun from reaching his solar panels.

In late 2007, a court ruled (under the Solar Shade Act of 1978) that the trees were a nuisance and would have to be pruned or cut down, despite having been there first. In 2008, the state legislature responded by passing a new law, allowing trees that had been planted before solar panels were installed to grow in peace.

(a) Suppose all the benefits of solar panels went to their owner. Which rule – the old Solar Shade Act, or the law passed in 2008 – would lead to the efficient number of solar panels being installed? Why?

(b) If solar panels create a positive externality – by reducing the demand for electricity, in turn reducing pollution – might this change your answer to part (a)? Explain.

CONTRACT LAW

Fortunate Contingency

Ann's uncle dies and leaves her a beautiful 1959 Corvette in flawless condition. Having no interest in old cars, Ann agrees to sell it to Betty for $25,000, a fair price given the condition it's in.

Not wanting such a beautiful car to get snowed on, Betty pays $1,000 to rent an indoor parking space close to her home. This reliance is both efficient and foreseeable, and the $1,000 is not refundable. From having the car and the parking space, Betty expects to get a benefit of $40,000.

Two days before Ann and Betty meet to exchange money and keys, Carol hears about the arrangement, and offers Ann $50,000 for the car.

(a) Who is the **efficient owner** of the car?

(b) How much would **reliance damages** be if Ann breached the contract with Betty in order to sell to the new buyer? How much would **expectation damages** be? Who will end up owning the car if the contract between Ann and Betty is protected by **expectation damages**?

(c) Suppose the contract is protected by **specific performance**; Carol doesn't like Betty and doesn't want to buy the car from her; and Ann and Betty are unable to renegotiate the contract. Who will end up with the car? What will Ann's and Betty's payoffs be?

(d) Under a specific performance remedy, what would be the **gains from cooperation** if Ann and Betty agreed to void their contract so that Ann could sell the car to Carol? What would be Ann's and Betty's **threat points** during negotiations? If the gains from cooperation were split evenly between them, **how much** would Ann have to pay Betty to get out of the contract?

(e) Which remedy, expectation damages or specific performance, leads to more efficient outcomes when the **transaction costs** to renegotiate a contract are **low**? What about when the transaction costs to renegotiate are **high**?

Soybean Farming

Bob is a soybean farmer. One February, he buys a plot of land to grow soybeans. A week later, he signs a contract with a local grocery store to provide 3,000 bushels of soybeans that September for $10 per bushel. A week after that, the grocery store owner pays $1,000 to expand his storage area, so that he will be able to store the soybeans when they are delivered. The grocery store plans to sell the soybeans for $13 a bushel.

In March, the state legislature decides soybean plants are ugly, and in an attempt to "beautify the state's highways and by-ways," passes a regulation banning the growing of soybeans within sight of a public road. Unfortunately, all of Bob's newly-acquired land is within sight of a road.

Following the new legislation, Bob is unable to deliver the soybeans, and the owner of the grocery store sues.

    (a) Calculate expectation damages.
    (b) Calculate reliance damages.
    (c) Bob claims he was unable to perform on the contract to sell soybeans without violating the law. What doctrine of contract law covers this situation?

Bob paid $10,000 for the land, expecting it to be worth about than much as a soybean farm. He now sees the land as worthless, and sues the state, claiming he was harmed by the new regulation.

    (d) Explain what is meant by a "regulatory taking." If the land is now worthless to a soybean farmer but worth $10,000 to a farmer who grows corn, would the legislature's action be considered a regulatory taking?

Now suppose it's discovered that the regulation banning soybeans was actually passed two days **before** Bob bought the property.

    (e) What would happen to the contract Bob signed to **buy the land from its original owner** if it were shown that neither Bob nor the original owner knew about the regulation at the time of the sale?
    (f) Suppose the original owner knew about the regulation, and knew that Bob was a soybean farmer. Did the sale unite knowledge and control? Should it be enforced?

Bob somehow manages to get the sale voided, and buys land in another state where soybean farming is still legal. Again, he signs a contract with a grocery store to provide soybeans in the fall. Right before the harvest, a fire destroys his crop, and Bob is unable to deliver the soybeans he had promised; the grocery store owner sues.

    (g) What doctrine in contract law covers this situation? Is it a formation defense or a performance excuse?
    (h) Who do you think is the efficient bearer of the risk of fire, Bob or the grocery store owner? Why? Given your answer, what should be the remedy when Bob breaches his contract to sell soybeans?

Renegotiating Contracts

I run a retail store that hires extra cashiers for the holiday rush. Each year, we sign six-week contracts with short-term employees, under which we train them for two weeks before Thanksgiving and then employ them as cashiers for all of December at a pre-agreed wage.

Consider the following two scenarios:

- You agree to the contract. The day after Thanksgiving, I've already invested time and money in training you, and don't have time to train a replacement; you suddenly realize you're in a strong bargaining position, and threaten to quit unless I raise your salary. Feeling I have no choice, I rewrite the contract to pay you more.

- You agree to the contract. Watching you interact with customers and other employees during training, I realize you're better suited to be a store manager than a cashier. The work is harder – you wouldn't agree to do it for the same wage – but your additional value to me as a manager is much greater than the additional cost (effort) to you. We rewrite the contract to make you a manager and pay you more.

(a) Give an economic argument why the renegotiated contract should be enforced in the second scenario, while the original contract should be enforced in the first.

(b) Would either renegotiated contract be enforced under the Bargain Theory of contracts?

Reliance and Breach

Explain why…

(a) expectation damages lead to efficient breach.

(b) the efficient level of reliance is decreasing in the probability of breach – that is, the more likely a promisor is to breach, the lower is the efficient level of reliance.

(c) including the anticipated benefit from reliance investments in the calculation of expectation damages leads to overreliance.

Buyer Breach and Default Rules

(Most of the examples we saw in contract law involved seller breach – when the seller of some object attempts to get out of the sale. This question examines what happens when it is the *buyer* who breaches.)

Ed walks into a car dealership and agrees to buy a car. The dealer doesn't have one in stock in the color he wants, so the dealer arranges to have the car delivered from another dealer.

(a) When he goes to pick up the car, Ed might realize he doesn't like the color quite as much as he thought he would. Assume the dealer can costlessly return the car to the other dealer, but expected to earn substantial profits on the sale. Explain why a rule allowing Ed to void the sale and pay nothing will lead to inefficient breach, while a rule forcing Ed to pay the dealer his "lost profits" (the amount he expected to profit from the transaction) will lead to efficient breach.

(b) Aside from not liking the color, there are several other risks that might result in Ed needing to get out of the contract: he might fail to get a car loan, lose his job, or be unable to get car insurance. Suppose that for 75% of buyers, the buyer is the efficient bearer of these risks; while for the other 25% of buyers, the seller is the efficient bearer of these risks.

    i.   Explain what a **majoritarian default rule** would say about liability for buyer breach in these situations.

    ii.   Under this rule, what should happen for efficiency in the 25% of cases where the seller is the efficient bearer of these risks? Would you expect the price paid for the car to be higher or lower in those cases?

(c) Finally, suppose that car dealers are very familiar with contract law, but that most car buyers are not, and might not suspect that they would owe anything if they backed out of a sales contract. Explain why the majoritarian rule in part (b) might not always lead to efficient outcomes. Explain why a default rule allowing a buyer to breach without paying anything *unless the contract specified differently* could lead to efficiency, and why this could be referred to as a **penalty default**.

Shipping

Baxendale runs a shipping company, and can ship his clients' packages via either the U.S. Postal Service or Federal Express. Shipping by USPS costs $20, but there is a 1 in 50 chance the package will be a week late. Shipping by FedEx costs $50, but there is no chance the package will be late. Suppose that for three-quarters of Baxendale's clients, a week's delay would cause $1,000 worth of inconvenience; for the other quarter, the package is urgent, and a week's delay would cost $5,000.

   (a) What is the efficient means of shipping for an urgent package? For a non-urgent package?

   (b) Suppose Baxendale can't tell whether a particular package is urgent or not. The expected value of a week's delay is therefore $2,000. If expectation damages are based on the actual cost of delay, what would he choose to do?

   (c) A different rule would hold Baxendale liable for only $1,000 in the event of a delay, unless the client specifically told him the package was urgent. Explain why this could be referred to as a penalty default, and what outcomes you expect it to lead to.

Fortunate Contingency
(From Thomas Miceli, *The Economic Approach to Law*, 2009, Stanford University Press)

A buyer hires a manufacturer to build a specialized machine for delivery on a certain date. The value of the machine to the buyer is $2,000, and the price, payable on delivery, is $1,500. Suppose that after the machine is completed but before delivery, a second buyer arrives and offers the manufacturer $2,500 for it.

   a. From a social (efficiency) perspective, who should get the machine?

   b. Calculate the value of expectation damages for the first buyer and show that it gives the seller the correct incentives regarding breach of the original contract.

   c. Suppose the first buyer went to court, and was granted a specific performance remedy. How will this affect the ultimate ownership of the machine compared to expectations damages? (Assume that the first buyer is aware of the second buyer's offer and that the two buyers can bargain.)

   d. The arrival of the second buyer created a "surplus" of $500 (the excess of his offer over the valuation of the first buyer). Describe how this surplus is divided between the seller and first buyer under the two breach remedies.

TORT LAW

Plastic Surgery and Nuclear Power

Here are two observations about voluntary cosmetic surgery:
- anyone who wants to have it done can probably find a doctor happy to operate; so we can assume that the number of operations is driven by how many people request the surgery
- once a patient is under anesthesia, there's very little he or she can do to contribute to the safety of the operation

Thus, it's probably reasonable to think that the number of plastic-surgery accidents is determined by the levels of doctor (injurer) precaution and patient (victim) activity.

On the other hand, consider the health and environmental risks posed by privately-owned nuclear power plants. There are no feasible precautions for potential victims; the number of accidents depends on the level of care taken by plant workers (injurer precaution) and the original decision of how many plants to build and their locations (injurer activity).

Assume that perfect compensation is possible in both cases, and neither cosmetic surgeons nor nuclear power plant owners are judgment-proof.

(a) First, suppose the price of cosmetic surgery is set without regard for the liability rule – say, by government regulation – and that patients correctly perceive the risks of surgery. Cosmetic surgery and nuclear power favor different liability rules: strict liability leads to more efficient outcomes in one case, simple negligence leads to more efficient outcomes in the other. Explain which situation favors which rule, and why. (Don't just state that one rule is more efficient under certain conditions, *explain why* this is the case.)

(b) Now suppose instead that the supply of plastic surgery is perfectly competitive, so that surgeons earn zero profits and surgeons' expected liability costs are incorporated into prices.
   i. Explain why either strict liability or simple negligence will lead to efficient outcomes in plastic surgery if patients correctly perceive the risk of accidents.
   ii. Which rule will lead to better outcomes if patients underestimate the risk of surgery? Explain why.

The Joy of Skydiving

Skydiving – jumping out of an airplane with a parachute – is incredibly fun, but also dangerous. The risk of dying in a skydiving accident is actually very small – for this problem, we will assume it is zero. However, there is a substantial risk of other injuries.

There are standard precautions a skydive operator can take – such as using more modern equipment, hiring experienced instructors, and taking extra care in packing the parachutes – to reduce this risk. The cost of running a skydiving business is $150 per customer without these precautions; these precautions cost an additional $100 per customer, and reduce the probability of injury from 1 in 100 to 1 in 300. The average skydiving injury does $30,000 worth of harm to the customer.

There are five potential customers, each with one opportunity to skydive; the joy each one would get from skydiving is worth $500, $400, $300, $200, and $100, respectively. (That is, the most enthusiastic customer would get a benefit of $500, the second-most-enthusiastic $400, and so on.)

> (a) What is the **efficient level of precaution** for skydive operators to take (high or low)?

> (b) Given this precaution level, what is the **efficient level of activity**? (That is, how many customers are there for whom the benefits of skydiving outweigh the total costs?)

Suppose there is **perfect competition** in the skydiving industry – there are many skydive operators, with identical costs, so the price of skydiving is driven down to marginal cost plus expected liability payments (if any).

For parts (c)-(f), assume that customers **correctly perceive** and consider the risk of injury when deciding whether to skydive, and can observe the level of precaution taken by each skydive operator.

> (c) Under a rule of **no liability**, what level of precaution will operators take? **Why?**

> (d) Under perfect competition (assumed throughout this problem), what will be the price of skydiving?

> (e) What will customers perceive as the total cost of skydiving? How many customers will choose to skydive?

> (f) Are precaution and activity higher, lower, or equal to the efficient levels?

For parts (g)-(j), assume instead that customers are **unaware of the risk of injury**, and completely ignore it when deciding whether or not to skydive – they simply weigh the financial price against the benefit. Continue to assume the skydiving industry is perfectly competitive.

(g) Under a rule of **strict liability**, what level of precaution will operators take? What will be the price of skydiving? How many customers will choose to skydive?

(h) Under a rule of **simple negligence** (where anything less than the efficient level of precaution is considered negligent), what level of precaution will operators take? What will be the price of skydiving? How many customers will choose to skydive?

(i) Under a rule of **no liability**, what level of precaution will operators take? What will be the price of skydiving? How many customers will choose to skydive?

(j) Which of these rules is the most efficient?

More Skydiving: Judgment-Proof Sellers

Recall the skydiving scenario described above – 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?

(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?

(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."

Strict Liability, Negligence, and Drivers

Suppose we believe the following facts about car drivers and bicyclists:

- Driving more carefully reduces the probability of causing an accident, but bicycling more carefully does not change the probability of being hit – other than riding less, there is nothing bicyclists can do to reduce the likelihood of an accident

- On weekdays, most car drivers are just commuting to and from work, so the amount they drive is very inelastic (very unresponsive to incentives)

- Bicyclists, on the other hand, are a mixture of commuters and pleasure riders, so the number of bicyclists is more responsive to incentives

Given these facts,

(a) Explain why a strict liability rule would lead to the **efficient level of precaution** by drivers.

(b) Explain why a strict liability rule **would not lead to the efficient number of weekday accidents**. Would bicyclist activity be higher or lower than the efficient level?

(c) Explain why a **simple negligence** rule would lead to both the efficient level of driver precaution and the efficient number of weekday accidents.

Next, consider the harms caused by a different type of driver: pizza deliverymen who hit pedestrians. We will assume that the pizza industry is perfectly competitive, so the price of a pizza reflects the marginal cost of the ingredients, the labor to make it, and the cost of delivering it (including the pizzeria's expected liability). Also assume that consumers are smart – people understand the risks inherent in ordering and eating pizza.

(d) Explain why both strict liability and negligence rules would lead to **efficient precaution** by pizza delivery drivers.

(e) Would a **simple negligence** rule lead to the efficient level of activity, that is, the efficient number of pizzas being delivered? Why or why not? If not, would the number of pizzas delivered be inefficiently high or inefficiently low?

(f) Explain why a **strict liability** rule leads to the efficient level of activity, and therefore the efficient number of pizza delivery-related accidents.

Lion Tamers

Suppose you are a lion tamer in a circus. Having a live lion in a circus show is clearly risky, but the risk depends on how much training the lion tamer has had. Suppose that if the lion tamer has not been trained at all, there is a 32% chance the lion will get out of control and bite someone. For each month of training, this risk is cut in half: after one month of training, the risk is 16%; after two months, 8%; after three months, 4%; and so on. Each month of training costs $5,000. Training is only offered in full months; partial months of training are not allowed.

A lion bite is a serious injury, doing $100,000 worth of harm.

(a) What is the efficient level of precaution, that is, what is the socially optimal number of months of training for you to get? (Hint: it is easiest to answer this by first considering whether the first month of training is efficient, then the second month, and so on.)

(b) How much training would you choose to get under a strict liability rule? Why?

(c) Suppose there was a simple negligence rule in place, and courts correctly applied the Hand Rule to determine whether your level of training constituted negligence. How much training would be required to avoid liability? How much training would you choose to get?

(d) Suppose that due to hindsight bias, if the lion ever actually bit someone, courts would then believe that an accident had actually been twice as likely as it really was. Applying the Hand Rule under that belief, what level of training would a court require to not be considered negligent?

(e) Suppose either rule would be implemented correctly. Which rule, strict liability or simple negligence, would work better to get the efficient number of people becoming lion tamers? Why?

Suppose that taming lions doesn't pay well, so lion tamers are unlikely to be able to pay a $100,000 damages award.

(f) Explain what it means for lion tamers to be judgment-proof, and what implications it has for the incentives for precaution.

(g) Explain how each of the following three alternatives could be used to solve this problem: vicarious liability, safety regulation, and criminal law.

LEGAL PROCESS

Pre-Trial Bargaining

An accident has occurred, causing $10,000 in harm to the victim. The amount of harm done is undisputed and easy to prove; punitive damages are not applicable, so any damage award would be for exactly $10,000.

This type of accident is governed by strict liability, so the injurer is legally responsible, but it may be difficult to prove in court that he caused the harm. The victim can hire a lawyer for $3,000 and go to trial, in which case he would have a 40% chance of winning. He could also hire an expert witness to testify. This would ensure victory at trial, but would cost an additional $10,000, for a total of $13,000. Going to trial costs the defendant (injurer) $5,000, regardless of whether the plaintiff (victim) hires an expert witness. Assume that neither party pays any legal expenses if an out-of-court settlement is reached.

First, consider the usual American rule where each party pays its own legal fees.

- (a) If the case goes to trial, will the plaintiff hire an expert witness or not?
- (b) Given your answer to (a), calculate
    - i. each party's threat point during pre-trial negotiations (which is its noncooperative payoff if the case goes to trial)
    - ii. the gains from cooperation if a pre-trial settlement is reached
    - iii. the settlement that would occur if the two parties agreed to divide the gains from cooperation evenly
- (c) In this scenario, would the American rule lead to over-, under-, or efficient precaution on the part of the injurer?

Next, consider the usual British rule where the losing party pays both sides' legal fees.

- (d) If the case goes to trial, will the plaintiff hire an expert witness?
- (e) Given your answer to (d), answer the same three questions as before: calculate
    - i. each party's threat point
    - ii. the gains from cooperation
    - iii. the settlement that would occur if gains from cooperation were divided evenly
- (f) In this scenario, would the British rule lead to over-, under-, or efficient precaution on the part of the injurer?

Finally, consider the following cost-shifting rule, similar in spirit to Federal Rule 68. If the case goes to trial and no damages are awarded, each side pays its own expenses. If damages are awarded and are lower than a settlement offer the plaintiff (victim) refused, the plaintiff pays both sides' expenses. If damages are higher than a settlement offer the defendant (injurer) refused, the defendant pays both sides' expenses.

- (g) What will happen if the case goes to trial after the defendant (injurer) offers to settle for $10,001? Is the plaintiff (victim) better off accepting this offer or going to trial?

(h) What will happen if the case goes to trial after the plaintiff offers to settle for $9,999? Is the defendant better off accepting this offer or going to trial?
(i) What do you expect to happen in pre-trial negotiations?
(j) In this scenario, would this cost-shifting rule lead to over-, under-, or efficient precaution on the part of the injurer?

CRIMINAL LAW

Fighting Crime

Suppose a particular crime is always inefficient: it harms the rest of society $10,000 more than it benefits the criminal. Every time an offender is caught, he or she is tried, convicted, and imprisoned; the total (social) cost of trials and punishment is $100,000 per criminal caught.

Recall that the aim of criminal law is to minimize 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.

A city is considering hiring additional policemen dedicated to detecting this particular crime. This change would increase the fraction of offenders who get caught from 15% to 20%.

a. Suppose this increase in detection would result in a decrease in the number of crimes committed from 1,000 a year to 700 a year.

   i.   Calculate the effect that hiring the new policemen would have on the social cost of crimes committed.
   ii.   Calculate the effect it would have on the cost of trying and punishing offenders.
   iii.   From an efficiency point of view, what is the most that the city should be willing to pay for the new policemen?

b. Now suppose instead that the increase in detection would decrease the number of crimes committed from 1,000 a year to 900 a year.

   i.   Calculate the effect that hiring the new policemen would have on the social cost of crimes committed.
   ii.   Calculate the effect it would have on the cost of trying and punishing offenders.
   ii.   From an efficiency point of view, is there **any** positive amount that the city should be willing to pay for the new policemen?

c.   Defend the following statement applied to this type of crime:

   "Even when detection is cheap, more detection is only efficient if the supply of crimes is elastic."