Review: Ex Ante/Ex Post

- The idea—control input vs control output
- The advantage to output
  - Easier to measure actual damage than expected damage
  - Gives actor an incentive to monitor himself
  - Use his private information, but …
    - That might be a liability if his private information is wrong.
- The advantage to input
  - Can use smaller punishment, which may be more efficient
    - Note that the question is whether punishment cost is more or less than
      - Proportional to amount of punishment
  - Can impose the court’s view of the causal relationships—which could be good or bad.
- In practice, often do both—speed limit and tort liability.
- Also, since output of one act is input of another, same law might be both
  - Speed limit is ex ante in our sense, but …
  - Ex post if you think of controlling speed by brake, accelerator, ….

Chapter 6: Economics of risk

- Why is this here?
  - A lot of legal rules are about allocating risk, such as …
    - product liability rules
    - breach rules under contract
    - Negligence v strict liability
- Economics of insurance provides a context for analyzing such questions
- Considerations include
  - Risk aversion
  - Moral Hazard
  - Adverse Selection

Risk Aversion

- What it is
  - Given the choice between a certain outcome ($100)
  - And a gamble with the same expected value (.5 chance of $200)
  - You are risk averse if you always prefer the former
- Risk Aversion=Declining Marginal Utility of Money
  - If each additional dollar adds less to your happiness
  - Then the second $100 is worth less than the first, so
  - $200 is worth less than twice as much as $100
  - So, .5 chance of $200 is worth less than 1.0 chance of $100
- “Risk Aversion” is a misleading term, because
  - You might have declining marginal utility for money, but ...
    - Increasing marginal utility for number of children or years of life
- This is very much like the standard argument for transferring income from rich to poor
  - If you could insure, before being born, against being born poor
  - You would, since you would be trading less valuable dollars (when born rich) for more valuable (when born poor)
- If you are risk averse, you will want to insure against your house burning down
  - You are trading low value dollars (if it doesn’t burn down)
  - For high value dollars (if it does, making you poorer)
- Lottery-insurance paradox
  - If you are risk averse, you should buy insurance but not lottery tickets
  - If you are risk preferring, you should buy lottery tickets but not insurance
  - Yet some people buy both.

Moral Hazard: Take 1

- If your factory is insured against fires
  - Why pay the extra cost of a sprinkler system?
  - The money you save by preventing a fire is the insurance company’s, not yours
  - So you will take an inefficiently low level of precautions
  - The sprinkler system
    - Saves, on average, $100,000 (reduces by 1% chance of $10,000,000 fire)
    - Only costs $50,000
    - But you don’t buy it because, with 90% insurance, it saves you only $10,000
  - Health insurance
    - You have an incentive to go to the doctor too often,
    - Not take care of yourself enough.
    - Ski and ski dive more than you should
  - Externality problems—but ones voluntarily chosen
    - You are paying for the inefficiency
      - The insurance company charges based on the observed risk
      - To insured factories—which in part reflects
        - The lack of sprinkler systems
    - You get insured because the inefficiency due to the resulting externality
    - Is less than the gain due to reduced risk
Moral Hazard: Take 2

- Is Moral Hazard a bug or a feature?
  - Perhaps the insurance company is better qualified than you are to decide how to keep your factory from burning down—and sets conditions for insurance
    - This works for precautions they can observe, such as a sprinkler system
    - But not for how well you enforce rules against smoking
  - Service contracts insure against small losses, which seems to make no sense
    - But Sears is more expert in getting your appliance fixed than you are
    - And the service contract makes it in their interest to have it done right and cheaply
  - We are back to Coaseian double causation.
    - We want you to have an incentive to take precautions, not break appliances, etc.
    - But we want someone else to also have an incentive to deal with the same problems
  - Putting the incentive where it does the most good

Coinsurance

- Insure the factory for 70% of value
  - I get most of the risk aversion gain, and …
  - Still have an incentive to take at least the most useful precautions
    - I.e. the ones where benefit >> cost
  - More generally, the least bad solution
    - Might be to give each party some of the incentive
    - So that each will take those precautions that have a large benefit/cost ratio
    - Less inefficiency from failing to take precautions that are only barely worth taking
    - Arguably, that’s how tort law works
      - Despite the bumper sticker
      - Few of us actually want to be run into

A general point

- Getting an incentive wrong by $10
  - Is usually much less than ten times as bad
  - As getting it wrong by $100
  - Because the larger error both results in more wrong choices and choices that are more wrong
- Consider taxation
  - A ten times higher sales tax on books
    - Not only discourages about ten times as many sales
    - It discourages readers who really like books
    - As well as those for whom a book is barely worth buying
  - Which is an argument for taxing
    - Lots of things a little
    - Instead of a few things a lot

Adverse Selection

- Market for lemons
  - Seller of a car knows if it is a lemon or a creampuff
  - Buyer does not, so offers the same price for both
  - The owner of a lemon is more likely to accept that price
  - So accepting is evidence the car is a lemon, so
  - Buyers offer a price lower than the average value of cars
  - And now even fewer of the good cars sell
- What is the problem?
  - Not “it sells at the wrong price” (distribution) but “it doesn’t sell” (allocation, efficiency)
- Solution? Seller provides a guarantee.
  - Which brings back moral hazard.
    - Why should I take good care of the car?
    - If something goes wrong, the seller will have to pay for it
Consider the Case of Genetic Testing

- Assume we have a good test for how bad a risk you are—how likely to die or have expensive medical problems.
  - Insurance companies would like to know
  - So would you
  - In part to decide whether to buy insurance
  - Think of it as “bad heart (genes)” vs “good heart”

- We could let insurance companies
  - Insist on a test before insuring you
  - Or offer lower rates if you have been tested and are low risk.

- We could forbid them from doing so
  - But let individuals get tested
  - What are the consequences?

- We could ban the test for everyone
- Which alternative is best? Why? Might we be better off if the test was never invented?

Insurance companies can require testing

- You cannot insure against being born with a bad heart
  - Just as you cannot now insure against being born poor
  - Because the outcome is known before you buy the insurance

- You could refuse to be tested and try to buy insurance
  - But the insurance company will conclude that you probably got tested, discovered you were a bad risk
  - And that’s why you don’t want them to test you
  - And they will price your insurance accordingly

- Can insure against residual (non-genetic) risk
  - At a low price if you have a good heart
  - At a high price if you have a bad heart

Nobody can use it (or it doesn’t exist)

- Insurance Companies may not
  - Require the test, nor …
  - Charge more to those who refuse

- What happens?
  - Insurance company charges assuming you have an “average” heart?
  - You can still get tested, not tell them the result
    - If you have a bad heart
      - Insurance is a good deal
      - So you buy it
    - If you have a good heart, bad deal, don’t buy it
    - So mostly the people who buy insurance have bad hearts

- The insurance companies discover this
  - If you buy insurance you probably have a bad heart
  - So they should charge everyone who buys accordingly
  - Making insurance an even worse deal if you have a good heart
  - Adverse selection at work

- You cannot insure against having a bad heart
- And can only insure against non-genetic risk if you have a bad heart
• What if insurance company
  – Knows if you have been tested
  – Can condition price accordingly
• If you have been tested, you can either
  – Let them know the result (or retest you)
  – Or let them assume you have a bad heart and charge accordingly
• If you have not been tested you can prove it
  – So they offer you insurance at the “average” price
  – Since you have an average chance of a bad heart
• If you want to insure against a bad heart, you
  – Buy insurance before you are tested
  – Then get tested if you want the information
• Now you can insure against both genetic and residual risk
• Clearly the best alternative—but may not be possible

Legal Rules to Think About
• I rent a house
  – It burns down
  – Should I or the owner bear the cost?
• I buy land from John
  – Paying with lead bars plated with gold
  – I sell the land to Bill
  – The fraud is discovered—but I’ve vanished
  – Who owns the land?
• I forge a deed to John’s land
  – Use the forged deed to sell the land to Bill
  – The fraud is discovered, I have vanished
  – Who owns the land?
• What are the common law rules? Why?

Review: Insurance
• Idea of risk aversion in money.
  – Not dislike of risk, but
  – Declining marginal utility of income.
  – Provides one reason to have insurance.
• Moral hazard is a reason not to have it
  – Since insurance creates an externality
  – Which leads to inefficient choices
  – Which you eventually pay for
• But also a reason to have it, since
  – Sometimes insurer can control risk better
  – Put the incentive where it does the most good.
    • Insurance company vs big firm with lots of factories.
    • Sears vs the individual owner of an appliance
    • Or to control adverse selection. Auto repairs.
• Adverse selection
  – Asymmetric information means that
  – Some worthwhile transactions don’t happen
    • Can’t sell a cream puff
    • Unless you are willing to accept a mostly lemon price

Genetic Testing
• With nobody testing
  – Genetic risk is insurable.
  – Residual risk is insurable, but …
  – You cannot know genetic problems and take precautions
• If you can test and insurer can require test
  – Genetic risk is not insurable
  – Residual risk is, and you can know your genetic problems
• If you can test, insurer can’t
  – Adverse selection may eliminate the insurance market
  – For all save the ones with the worst genes
  – Who can still insure against residual risk
• If you can test but the fact you did is public
  – Insure against genetic risk before testing
  – Then test if you want the information
  – You get insurance against both risks and you know
Chapter 7: Ex Post Ex Ante

• General issue
  – Judging decisions by probability going in or outcome afterwards
  – Punishing or rewarding

• Employment: Pay by output or by input
  – Commission system solves the monitoring problem
  – But you may starve
  – And output isn’t always observable

• Air pollution—“output” ?= “sick people due to your pollution.”
  – But effluent fees are payment by output, if output is pollution
    • Effluent fees are ex post control of pollution
    • Ex ante of pollution damage
  – There may be multiple layers of output

• Speeding ticket is by input to accidents, but …
  – Not by input to speeding (baroque trumpet music)
  – And some layers may be easier to observe than others

My analysis

• Implicit assumptions
  – Output is easier to measure from the outside than input
  – Input easier to measure from the inside (by actor) than from the outside.
  – Probabilistic process, such that input only sometimes produces output.

• From which it follows that:
  – Ex post gives you a better control over inputs, via incentives for actor to control them, but …
  – Also gives you larger punishments with lower frequency.
  – Trade off those two in deciding which you prefer

Punishment Costs

• Fines
  – I pay a $100,000 fine, the court collects it, net cost zero?
  – No—because of risk aversion
  – I face a negative lottery (one chance in 1000 of a $100,000 fine) which I would pay $150 to avoid, since I am risk averse
  – The court receives a positive lottery it would pay only $100 for.
  – Punishment cost $50

• Execution
  – I face a negative lottery I would pay $2000 to avoid (one chance in 1000 of death, value of my life to me $2,000,000)
  – The state has a positive lottery with zero value
  – Punishment cost $2000

• Imprisonment
  – I face a negative lottery I would pay $50 to avoid (1/1000 of year in jail)
  – Court has a negative lottery with $20 cost
  – Punishment cost $70

• High punishments -> high punishment cost
  – Not just proportionally high
    • That wouldn’t be a problem
    • Since the higher costs are paid proportionally less often
  – But more than proportionally higher
    • Fining me $2000/year for dangerous driving
    • Would cost me the same amount as hanging me when I am in an accident.
    • But give the state $2000 more

• How does litigation cost vary with the stakes?
  – If it is proportional to cost, then …
  – No advantage to either ex post or ex ante.

• We will return to all of these questions again
  – In criminal law: Why not hang them all?
  – Tort law
  – And the choice between them.
Implications for the Law

- If an offense does little damage
  - Ex post punishment is small, inexpensive
  - So use ex post enforcement
- Tort law uses fines (i.e. damage payments)
  - So risk aversion cost but otherwise cheap punishment
  - no punishment for attempts, so
  - Pure ex post system
- If an offense does a lot of damage
  - Use ex ante to get the punishment down to the fine level
  - But use some ex post as well—just not too much
- Are there any pure ex ante cases?
  - Speeding ticket plus damages if you crash combines post and ante, but ...
  - Pollution regulation, with civil immunity if you obey it?
  - How about tort law under a negligence standard?

Attempts

- Why punish unsuccessful attempts?
  - I aimed at John but hit a tree
  - Both John and the tree are fine—what’s the problem?
- As an odd sort of ex ante punishment
  - Shooting at someone is an input to hitting him
  - Five years for attempted murder, 20 for murder
    - Means five years as the ex ante punishment for trying
    - And fifteen more as the ex post for succeeding
- Why not punish successful attempts more instead?
  - Punishment costs?
  - As usual, we are combining ex ante and ex post
  - Arguably, we can’t get adequate deterrence with pure ex post
- Why punish impossible attempts?
  - “Sticking pins in a voodoo doll” doesn’t make death more likely
  - But “trying to kill someone in a way that might not work” does
  - So it depends on how people interpret the legal rule
  - “Voodoo attempts” vs “Impossible attempts”

Summary

- The idea—control input vs control output
- The advantage to output
  - Easier to measure actual damage than expected damage
  - Gives actor an incentive to monitor himself
  - Use his private information, but ...
  - That might be a liability if his private information is wrong.
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  - Speed limit is ex ante in our sense, but ...
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Insurance: Post->Ante

- Suppose we have a pure ex post system
  - If you are responsible for an auto accident
  - You pay the full cost of fixing both cars
- I can convert it into ex ante, by
  - Buying insurance
  - And having the insurance company make rules, such as speed limits
- Or a mixture, if they don’t insure the full amount
- It is in my interest to choose the optimal system—all the costs end up as mine
  - Since we are assuming that the victim is fully compensated
  - Hence enforcement costs, risk aversion, damage
  - All come out of my pocket
- Of course, insurance companies then need their own traffic cops to enforce the contract. Subcontract?