

Part 3: Property Law

Property Law

- ◆ Legal framework for allocating resources and distributing wealth
 - ◆ Economic Goal: efficient resource allocation
- ◆ Economic Theory of Property
 - ◆ Bargaining theory (game theory)
 - ◆ Public goods theory
 - ◆ Externalities theory

Why do we need property law in the first place?

- ◆ We already saw one reason
 - ◆ Tragedy of Commons – overuse of land is held in common
- ◆ For another example, imagine two neighboring farmers
- ◆ Each has two choices: **farm** his own land, or **steal** crops from his neighbor
 - ◆ Stealing is less efficient than planting my own crops
 - Have to carry the crops from your land to mine
 - Might drop some along the way
 - Have to steal at night → move slower
 - ◆ If I steal your crops, I avoid the effort of planting and watering

Why do we need property law in the first place?

- ◆ Suppose that planting and watering costs 5, the crops either farmer could grow are worth 15, and stealing costs 3

- ◆ With no legal system, the game has the following payoffs:

- ◆ We look for equilibrium

		<i>Player 2</i>	
		Farm	Steal
<i>Player 1</i>	Farm	10, 10	-5, 12
	Steal	12, -5	0, 0

- ◆ Like Prisoner's Dilemma
 - ◆ both farmers stealing is the only equilibrium
 - ◆ but that outcome is Pareto-dominated by both farmers farming

So how do we fix the problem?

- ◆ Suppose there were lots of farmers facing this same problem
- ◆ They come up with an idea:
 - ◆ Institute some property rights
 - ◆ And some type of government that would punish people who steal
- ◆ Setting up the system would cost something
 - ◆ Suppose it imposes a cost c on everyone who plays by the rules

So how do we fix the problem?

ORIGINAL GAME

		Player 2	
		Farm	Steal
Player 1	Farm	10, 10	-5, 12
	Steal	12, -5	0, 0

MODIFIED GAME

		Player 2	
		Farm	Steal
Player 1	Farm	$10 - c$, $10 - c$	$-5 - c$, $12 - P$
	Steal	$12 - P$, $-5 - c$	$-P$, $-P$

- ♦ If P is big, and c is not too big, then $12 - P < 10 - c$
- ♦ In that case, (Farm, Farm) is an equilibrium
 - ♦ Payoffs are $(10 - c, 10 - c)$, instead of $(0, 0)$ from before

So the idea here...

- ◆ Anarchy is inefficient
 - ◆ I spend time and effort stealing from you
 - ◆ You spend time and effort defending your property from thieves
 - ◆ Instead of doing productive work
- ◆ Establishing property rights, and a legal process for when they're violated, is one way around the problem

Overview of Property Law

- ◆ Cooter and Ulen: property is
 - “A bundle of legal rights over resources that the owner is free to exercise and whose exercise is protected from interference by others”
- ◆ Property rights are not absolute
 - ◆ Appendix to ch. 4 discusses different conceptions of property rights
- ◆ Any system has to answer four fundamental questions:
 - ◆ What things can be privately owned?
 - ◆ What can (and can't) an owner do with his property?
 - ◆ How are property rights established?
 - ◆ What remedies are given when property rights are violated?

How do we design property laws to achieve efficient outcomes?

Coase

How should property rights be allocated to achieve efficiency?

- ◆ Coase's surprising answer: **it doesn't matter**
- ◆ (Under certain conditions)

The Coase Theorem

- ◆ Ronald Coase (1960), *“The Problem of Social Cost”*
- ◆ **In the absence of transaction costs, if property rights are well-defined and tradable, voluntary negotiations will lead to efficiency.**
 - ◆ It doesn't matter how rights are allocated initially...
 - ◆ ...because if they're allocated inefficiently at first, they can always be sold/traded...
 - ◆ so the allocation will end up efficient anyway
- ◆ Initial allocation **does** matter for **distribution**, though
 - ◆ And if there are **transaction costs**, may matter for efficiency too



Ronald Coase
1910-2013

Example of Coase: you have a car worth \$3,000 to you, \$4,000 to me

- ◆ Obviously, efficient for me to own it...
- ◆ ...but we don't need the law to give me the car
 - ◆ If I start out owning the car:
no reason for you to buy it, I end up with it → efficient
 - ◆ If you start out owning the car:
clear incentive for me to buy it, I end up with it → efficient
 - ◆ **Regardless of who owns the car at first, we get to the efficient outcome**
 - I'd rather start out with the car – so I don't have to pay you for it
 - You'd rather start out with it – so you end up with more money
 - Efficiency doesn't care about distribution – how much money we each end up with – just who ends up with the car at the end.
 - And that doesn't depend on who starts with it.
- ◆ The key: **lack of transaction costs**

Another example: you want to have a party in the house next door to mine

- ◆ If it's efficient for you to have the party...
 - ◆ Your benefit from having the party is greater than my benefit from a good night's sleep
 - ◆ If you start out with the right to have the party, no problem
 - ◆ If I start out with the right to quiet, you can pay me for the right to have the party
- ◆ If it's efficient for you not to have the party...
 - ◆ Good night sleep is worth more to me
 - ◆ If I have right to silence, no problem
 - ◆ If you have right to party, I can pay you not to have it
- ◆ The point: either way, we achieve efficiency
 - ◆ If it's efficient to have the party, you have the party
 - ◆ If it's efficient not to, you don't
 - ◆ **Regardless** of who started off with the right

The conditions for this to hold

- ◆ Property rights have to be **well-defined**...
 - ◆ We need to be clear on who has what rights, so we know the starting point for negotiations
- ◆ ...and **tradable**...
 - ◆ We need to be allowed to sell/transfer/reallocate rights if we want
- ◆ ...and there can't be **transaction costs**
 - ◆ It can't be difficult or costly for us to buy/sell the right

Ex: Rancher's versus farmer's rights

- ◆ English common law: “**closed range**” or “**fencing-in**” (or “farmer’s rights”)
 - ◆ Ranchers have responsibility to control their cattle
 - ◆ Rancher must pay for any damage done by his herd
- ◆ Much of the U.S. at various times: “**open range**” or “**fencing-out**” (or “rancher’s rights”)
 - ◆ Rancher can let his cattle roam free
 - ◆ Not liable for damage they do to farmer’s crops
(unless farmer had a good fence and they broke through anyway)
- ◆ **Which rule is more efficient?**

Coase: either law will lead to efficiency

- ◆ If it's cheaper for the farmer to protect his crops than for the rancher to control his herd...
 - ◆ Under open range law, that's what he'll do
 - ◆ Under closed range law, rancher can pay farmer to build fence
- ◆ If smaller herd is more efficient, farmer can pay rancher to keep fewer cattle
- ◆ Coase:
 - ◆ Whatever is the efficient combination of cattle, crops, fences, etc....
 - ◆ ...the rancher and farmer will negotiate to that efficient outcome, **regardless** of which law is in place...
 - ◆ ...as long as the rights are well-defined and tradable and there are no transaction costs

Note that there's no sense of “blame” here

- ◆ Pigovian tax (Arthur Pigou)
 - ◆ Penalize firms for causing negative externalities
 - ◆ Requires us to “blame” one party
- ◆ Coase: doesn't matter who is “causing” the harm
 - ◆ “It is true that there would be no crop damage without the cattle. It is equally true that there would be no crop damage without the crops.”
- ◆ Coase isn't worried about “justice”, just efficiency
 - ◆ Doesn't matter if a polluter is actually charged for polluting...
 - ◆ ...or is allowed to pollute, but could be bribed to not pollute
 - ◆ Either way, without transaction costs, we'll end up getting the efficient amount of pollution!

Rancher and farmer: numerical example

- ◆ Three possibilities:
 - ◆ Rancher builds fence around herd... costs \$400
 - ◆ Farmer builds fence around crops... costs \$200
 - ◆ Do nothing, live with damage... costs nothing
- ◆ If **expected crop damage = \$100**
 - ◆ Open range: farmer lives with damage rather than building fence
 - ◆ Closed range: rancher pays for damage rather than fence
- ◆ If **expected crop damage = \$500**
 - ◆ Open range: farmer builds fence – efficient
 - ◆ Coase: closed range: rancher pays farmer to build fence
 - ◆ So efficient outcome under either rule

Quoting from Coase (p. 13):

Judges have to decide on legal liability but this should not confuse economists about the nature of the economic problem involved.

In the case of the cattle and the crops, it is true that there would be no crop damage without the cattle. It is equally true that there would be no crop damage without the crops.

The doctor's work would not have been disturbed if the confectioner had not worked his machinery; but the machinery would have disturbed no one if the doctor had not set up his consulting room in that particular place...

Quoting from Coase (p. 13):

If we are to discuss the problem in terms of causation, both parties cause the damage.

If we are to attain an optimum allocation of resources, it is therefore desirable that both parties should take the harmful effects into account when deciding on their course of action.

It is one of the beauties of a **smoothly operating pricing system** that... the fall in the value of production due to the harmful effect would be a **cost for both parties**.

What does Coase mean by “a cost for both parties”?

- ◆ If the cheapest alternative is for the farmer to build a fence for \$200...
 - ◆ The cost to build a fence is \$200
 - ◆ But the cost to not build a fence is **more than \$200** – since under a closed-range law, the farmer could ask the rancher for more than \$200 to build the fence
- ◆ “Opportunity cost”

So, summing up...

- ♦ Coase Theorem: **In the absence of transaction costs, if property rights are well-defined and tradeable, voluntary negotiations will lead to efficiency.**
 - ♦ The initial allocation of property rights therefore **does not matter** for achieving **efficiency**...
 - ♦ ...provided there are **no transaction costs**
 - ♦ (But if there are transaction costs, then the initial allocation can matter for efficiency...
 - ♦ ...and it will always matter for distribution)

A Theorem and a Corollary

Coase Theorem

If transactions costs are low enough, then private bargaining will result in an efficient use of resources, regardless of the legal assignment of property rights.

Corollary

When transactions costs are high enough to prevent bargaining, the efficient use of resources will depend on how property rights are assigned.

Transaction Costs

What are transaction costs?

- ♦ Anything that makes it difficult or expensive for two parties to achieve a mutually beneficial trade
- ♦ Three categories
 - ♦ **Search costs** – difficulty in finding a trading partner
 - ♦ **Bargaining costs** – difficulty in reaching an agreement
 - ♦ **Enforcement costs** – difficulty in enforcing the agreement afterwards

Bargaining costs come in many forms

- ◆ Asymmetric information
 - ◆ Akerloff (1970), “The Market for Lemons” – adverse selection

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 - ◆ Myerson and Satterthwaite (1983), “Efficient Mechanisms for Bilateral Trading” – always some chance of inefficiency

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- ◆ Uncertainty
 - ◆ If property rights are ambiguous, threat points are uncertain, and bargaining is difficult

Bargaining costs come in many forms

- ◆ Large numbers of parties
 - ◆ Developer values large area of land at \$1,000,000
 - ◆ 10 homeowners, each value their plot at \$80,000

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 - ◆ Holdout, freeriding
- ◆ Hostility

Sources of transaction costs

- ◆ Search costs
- ◆ Bargaining costs
 - ◆ Asymmetric information/adverse selection
 - ◆ Private information/not knowing each others' threat points
 - ◆ Uncertainty about property rights/threat points
 - ◆ Large numbers of buyers/sellers – holdout, freeriding
 - ◆ Hostility
- ◆ Enforcement costs

What we know so far...

- ◆ No transaction costs → initial allocation of rights doesn't matter for efficiency
 - ◆ wherever they start, people will trade until efficiency is achieved
- ◆ Significant transaction costs → initial allocation does matter, since trade may not occur (and is costly if it does)
- ◆ This leads to two normative approaches we could take

Two normative approaches to property law

- ◆ **Design the law to minimize transaction costs**
 - ◆ “Structure the law so as to remove the impediments to private agreements”
 - ◆ Normative Coase
 - ◆ “Lubricate” bargaining

Two normative approaches to property law

- ◆ **Design the law to minimize transaction costs**
 - ◆ “Structure the law so as to remove the impediments to private agreements”
 - ◆ Normative Coase
 - ◆ “Lubricate” bargaining
- ◆ Try to **allocate rights efficiently to start with**, so bargaining doesn’t matter that much
 - ◆ “Structure the law so as to minimize the harm caused by failures in private agreements”
 - ◆ Normative Hobbes

Which approach should we use?

- ◆ Compare cost of each approach
 - ◆ Normative Coase: cost of transacting, and remaining inefficiencies
 - ◆ Normative Hobbes: cost of figuring out how to allocate rights efficiently (information costs)
- ◆ When **transaction costs are low** and **information costs are high**, structure the law so as to **minimize transaction costs**
- ◆ When **transaction costs are high** and **information costs are low**, structure the law to **allocate property rights to whoever values them the most**

So now we have one general principle we can use for designing property law

- ◆ When transaction costs are low, design the law to facilitate voluntary trade
- ◆ When transaction costs are high, design the law to allocate rights efficiently whenever possible

When should unowned resources become owned?

- ◆ Privatize when cost of administering boundaries is less than cost of congestion



What can-should be subject to property law

What?

- ◆Property rules promote voluntary (market) exchange, while liability rules permit forced (legal) exchange. The distinction portrays the choice between markets and law in allocating resources.
- ◆Property rules should therefore be used when transaction costs are low (markets work well), while liability rules should be used when transaction costs are high.
- ◆But there are public goods for which private property rights may be inefficient, public or joint ownership may then be more efficient.

Public and Joint Ownership

- ♦ Common, or public, ownership may be superior to private ownership when the optimal scale of a given productive activity exceeds that which a single owner can optimally manage, or when non contractible aspects are crucial (Hart, Schlifer, Vishny).
- ♦ Group ownership can be beneficial in the presence of either cost or benefit spillovers. It can also share risks associated with land ownership such as uncertain crop yield (think at the work of Elinor Ostrom).

What can be privately owned?

- ◆ Private goods: rival and excludable
- ◆ Public goods: non-rival and non-excludable
- ◆ Conclusion:
 - ◆ Private goods should be privately owned
 - ◆ Public goods should be publicly owned

But this is not what happens, e.g. in terms of Intellectual Property Rights... ideas, art, once produced, are non-rival and non-excludable...

IPRs?

-
- ◆ Intellectual property has the characteristic of a public good in that the benefits can be simultaneously used by many.
 - ◆ However, if ideas and inventions become public property, innovators will have no incentive to create them in the first place.
 - ◆ The law of intellectual property, encompassing patents, trade secrets, copyrights, and trademarks, deals with this trade-off in various ways. Most notably, patents and copyrights give innovators exclusive rights to profit from their creations for a limited period of time.

Main Logic for IPRs

- ♦ The value of granting such patents is that they create a financial incentive for scientists to invest in socially valuable research to a degree correlated to the market demand for that innovation.
- ♦ It also ensure that innovation are made public, so that other people know and can go/search further.
- ♦ The cost is the distortion created by awarding monopoly control over an idea to its discoverer, with consequent underproduction.

Intellectual Property



patents

copyrights

trademarks

trade secrets

Intellectual Property

- ◆ Intellectual property: broad term for ways that an individual, or a firm, can claim ownership of **information**
 - ◆ **Patents** – cover products, commercial processes
 - ◆ **Copyrights** – written ideas (books, music, computer programs)
 - ◆ **Trademarks** – brand names, logos
 - ◆ **Trade Secrets**

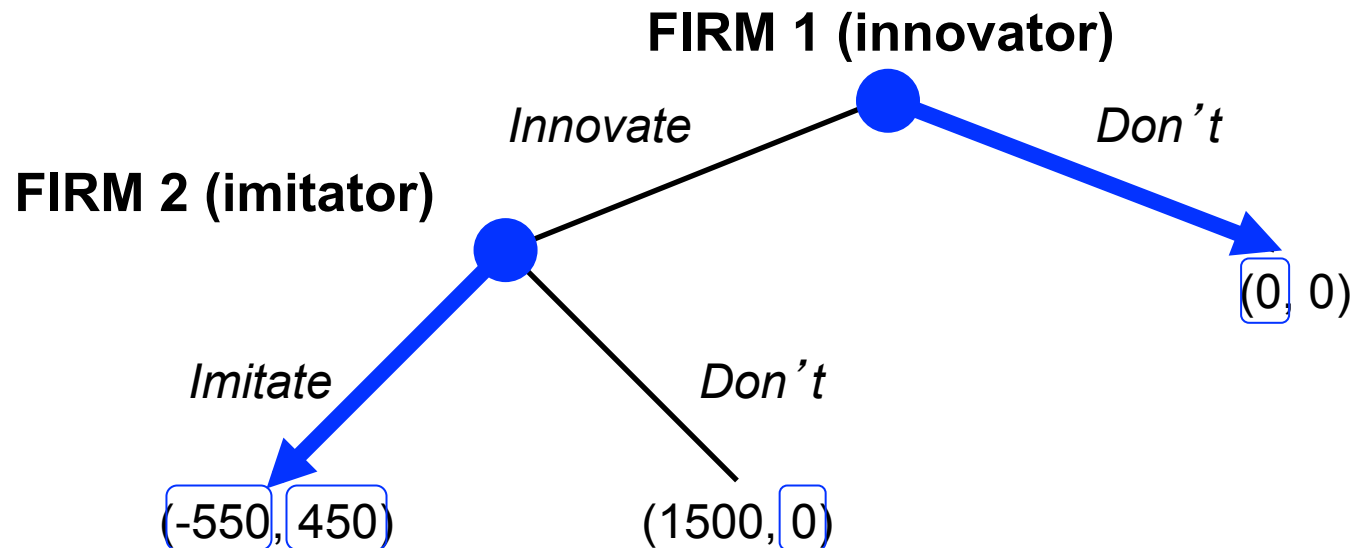
Information: costly to generate, easy to imitate

up-front investment: 1,000 monopoly profits: 2,500 duopoly profits: 450 each
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- ◆ Example: new drug
- ◆ Requires investment of \$1,000 to discover
- ◆ Monopoly profits would be \$2,500
- ◆ Once drug has been discovered, another firm could also begin to sell it
- ◆ Duopoly profits would be \$450 each

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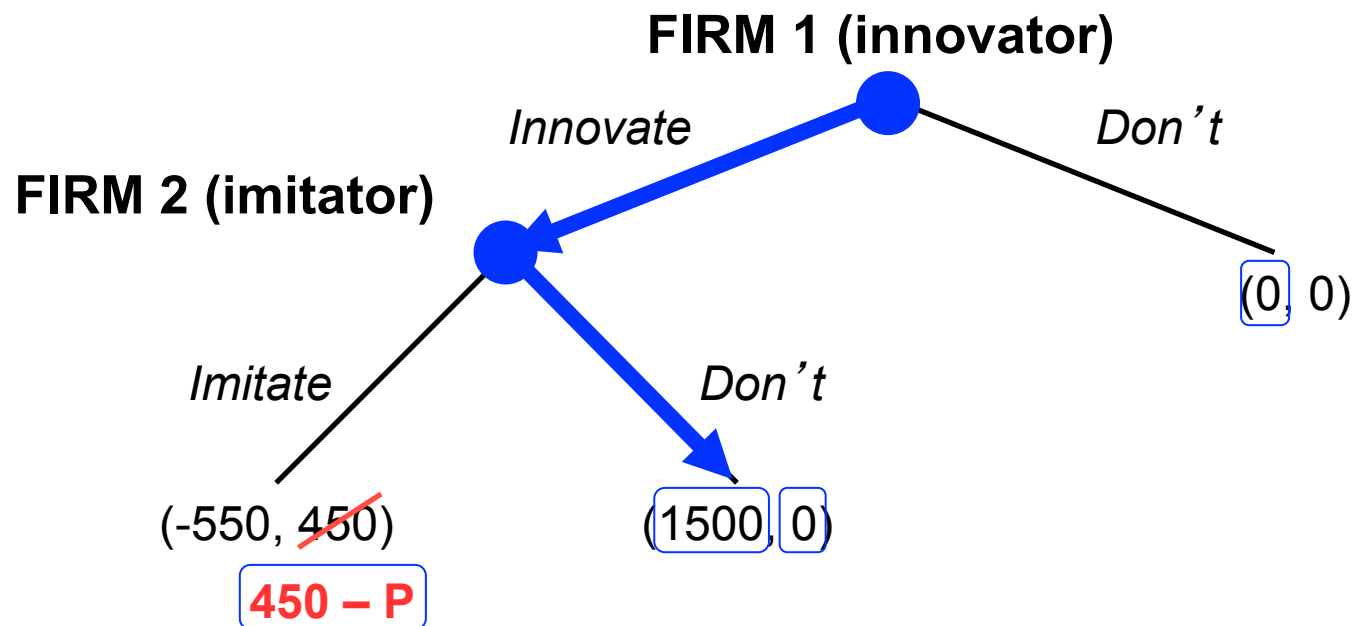


- ◆ Solve the game by backward induction:
 - ◆ Subgame perfect equilibrium: firm 2 plays *Imitate*, firm 1 plays *Don't Innovate*, drug is never discovered
 - ◆ (Both firms earn 0 profits, consumers don't get the drug)

Patents: one way to solve the problem

up-front investment: 1,000
monopoly profits: 2,500
duopoly profits: 450 each

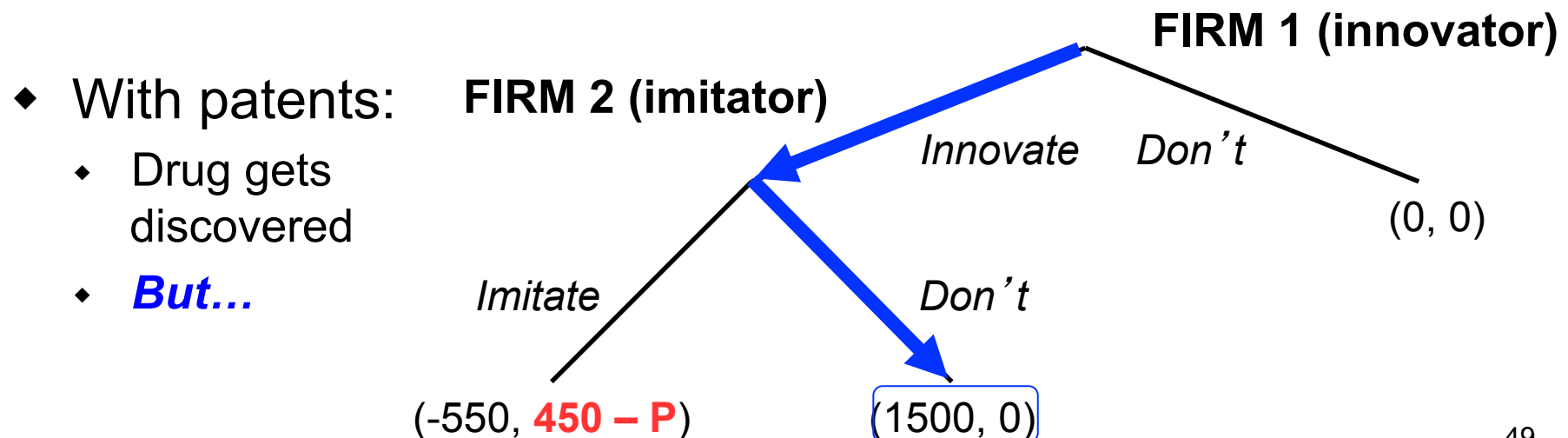
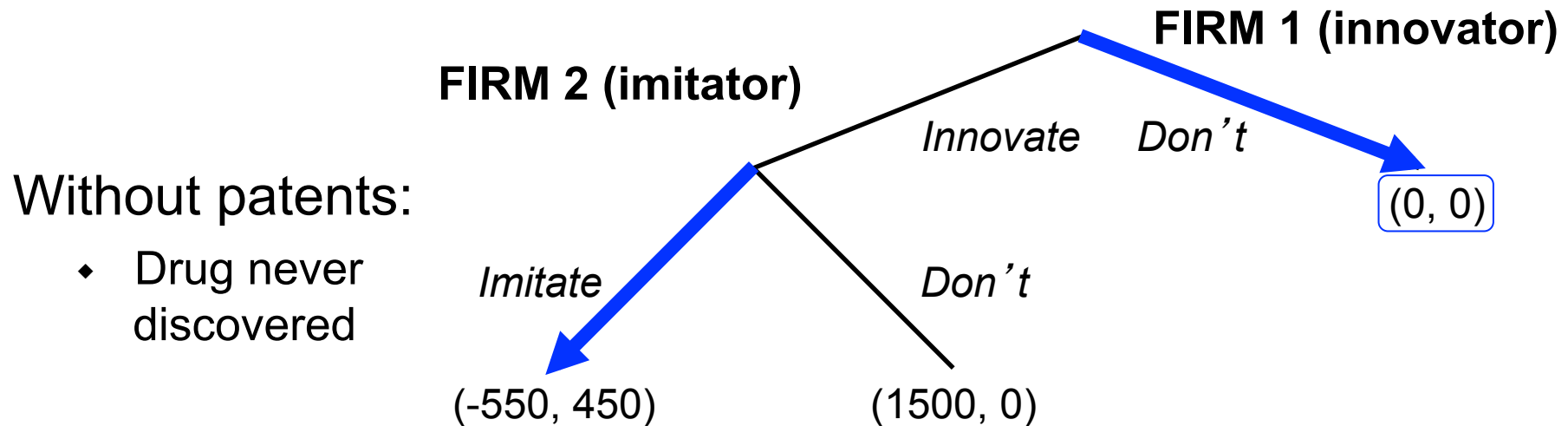
- ♦ Patent: legal monopoly
 - ♦ Other firms prohibited from imitating Firm 1's discovery



- ♦ Subgame perfect equilibrium: firm 2 does not imitate; firm 1 innovates, drug gets developed

Comparing the two outcomes

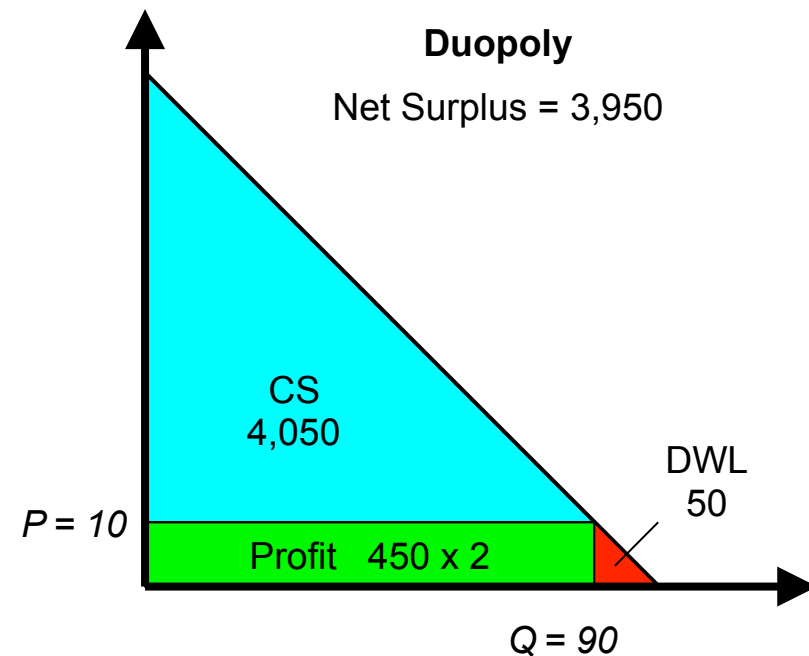
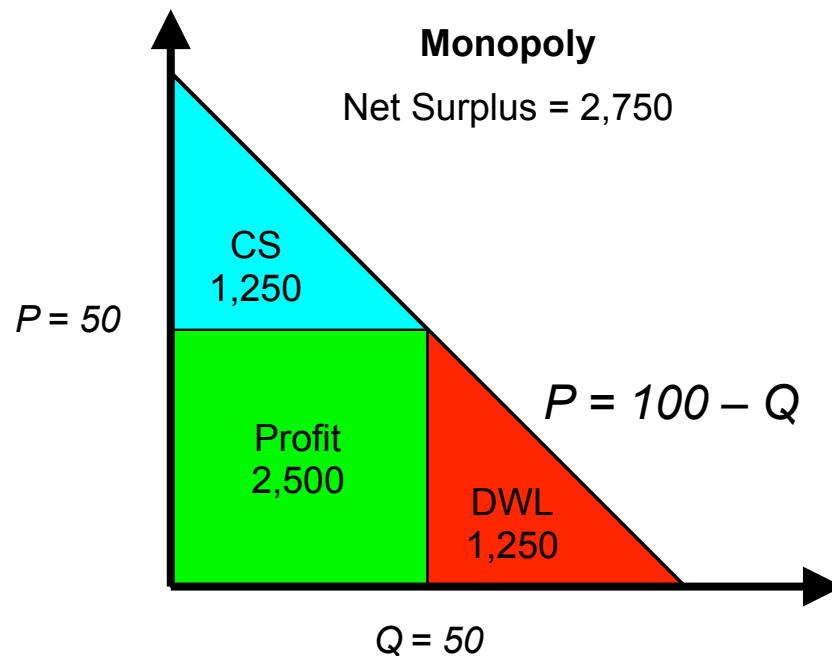
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Patents solve one inefficiency by introducing another

up-front investment: 1,000
monopoly profits: 2,500
duopoly profits: 450 each

- ◆ Without patents, inefficient outcome: drug not developed
- ◆ With patents, different inefficiency: monopoly!



- ◆ Once the drug has been found, the original incentive problem is solved, but the new inefficiency remains...

Patents: a bit of history

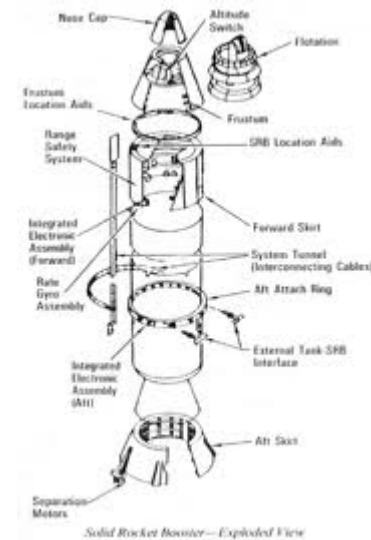
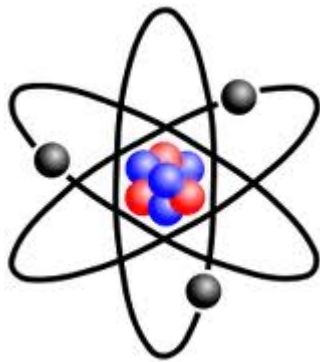
- ◆ First U.S. patent law passed in 1790
- ◆ Patents currently last **20 years** from date of application
- ◆ For a patent application to be approved, invention must be:
 - ◆ **novel** (new)
 - ◆ **non-obvious**
 - ◆ have **practical utility** (basically, be commercializable)
- ◆ Patentholder whose patent has been infringed can sue for both **damages** and an **injunction** against future violations
- ◆ Patents are **property** – can be sold or **licensed** to others

Patent breadth



- ◆ Narrow patents might allow us each to patent own invention
- ◆ Broad patents might not
 - ◆ “Winner-take-all” race to be first

Patent breadth



- ◆ Does a patent on the “pioneering invention” cover the application as well?
- ◆ Can you patent an improvement to an existing product?

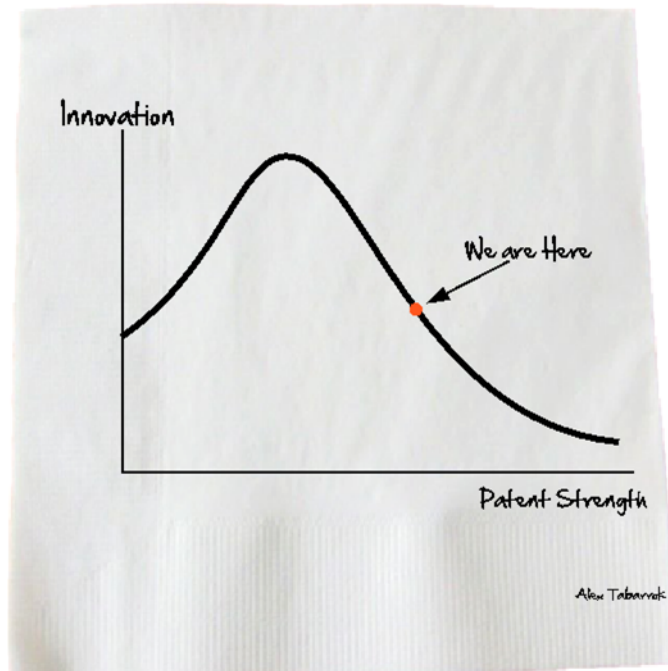
Patent length

- ◆ Patent length
 - ◆ Need to last long enough for firms to recover up-front investment...
 - ◆ ...But the longer patents last, the longer we have DWL from monopoly
 - ◆ (Example from textbook: drug price drops from \$15 to \$1 per pill when patent expires)
 - ◆ Tradeoff between ex-post inefficiency and ex-ante incentive provision
- ◆ U.S.: all patents last 20 years
 - ◆ Jeff Bezos (founder of Amazon) once suggested software patents should last just 3 years
 - ◆ Germany: full-term patents for major inventions, 3 year “petty patents” for minor ones, annual renewal fees

Marginal Revolution (blog): “Patent Policy on the Back of a Napkin”

***“Patent Policy on the Back of a Napkin”
(Marginal Revolution)***

*New York Times
a couple years ago*



- ◆ “Last year, for the first time, spending by Apple and Google on patent lawsuits and unusually big-dollar patent purchases exceeded spending on research and development of new products”
- ◆ (*“The Patent, Used as a Sword”*, 10/7/2012)

Do the details matter?

- ◆ Coase: without transaction costs, initial allocation of rights irrelevant for efficiency
- ◆ But transaction costs may be high
 - ◆ Uncertainty on whether a patent is valid
 - ◆ Uncertainty of outcome of research
 - ◆ Many parties

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Alternatives to patents to encourage innovation

- ◆ government purchase of drug patents
- ◆ prizes
 - ◆ Google \$30 million prize for landing a rover on the moon
- ◆ public procurement of innovation
- ◆ direct government funding of research
 - ◆ ~25% of research spending in U.S. is funded by government

Patent thicket, patent pools, etc.

Assembly problem and patents pools:

- ◆ In the case of DNA, for example, if several researcher hold property rights over different components of a given sequence, then a researcher who needs to make use of the entire sequence will have to obtain permission from each of the individual patent holders.
- ◆ This creates a difficult “assembly problem” that entails high transaction costs, thereby endangering the progress of research.
- ◆ Then patent pools emerge...

Many other economic and legal issues

- ◆ Blocking patents...
- ◆ Patent trolls...
- ◆ Standard setting organization...
- ◆ Frand limits to royalties...

Anti-commons?

- ◆ Common property is subject to the “tragedy of the commons”
 - ◆ Corrective: assign private property rights
- ◆ Patent thicket: Excessive ownership rights
 - ◆ Leads to under-use



patents



copyrights

trademarks

trade secrets

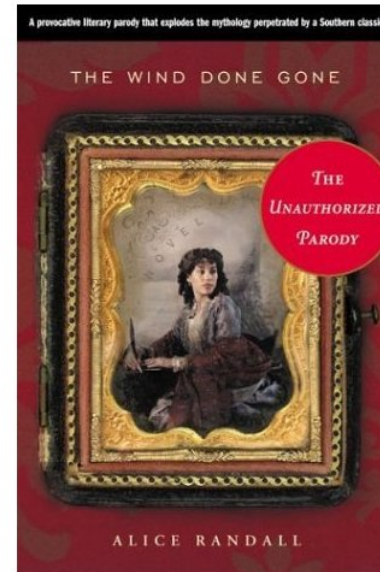
Copyright

- ◆ Property rights over **original expressions**
 - ◆ writing, music, other artistic creations
- ◆ Creations like this tend to fit definition of public goods
 - ◆ **nonrivalrous**
 - ◆ **nonexcludable**
 - ◆ so private supply would lead to **undersupply**
- ◆ Several possible solutions
 - ◆ government subsidies
 - ◆ charitable donations
 - ◆ legal rights to creations – **copyrights**

Copyright

- ◆ Copyright law less rigid than patent law
 - ◆ Unlike patent law, allows for certain **exceptions**
- ◆ Copyrights last much longer than patents
 - ◆ Current U.S. law: copyright expires **70 years after creator's death**
- ◆ No application process
 - ◆ Copyright law **automatically applies** to anything you've written/created
- ◆ Copyrights more narrow than patents
 - ◆ Cover **exact text**, not general idea

Copyright



- ◆ Retelling of Gone With The Wind, from point of view of a slave on Scarlett's plantation, published in 2001
 - ◆ Margaret Mitchell's estate sued to halt publication
 - ◆ Eventually settled out of court
 - ◆ Was there really any **harm**?

Trademarks



- ◆ Reduce confusion over who made a product
- ◆ Allow companies to build reputation for quality
- ◆ Don't expire, unless abandoned
- ◆ Generic names can't be trademarked

-
- ✓ patents
 - ✓ copyrights
 - ✓ trademarks
 - trade secrets

Trade Secrets

- ◆ Protection against **misappropriation**
- ◆ But plaintiff must show...
 - ◆ Valid trade secret
 - ◆ Acquired illegally
 - ◆ Reasonable steps taken to protect it

Property Law

Summary Comments & Discussion

Comments & Discussion 1

- ◆Property rights are legally enforceable rights to use, exclude others from use of, and profit from, one's assets.
- ◆The law enforces an individual's property rights up to the point where they become incompatible with another's rights.
- ◆In the language of economics, incompatible or incomplete property rights lead to externalities.
- ◆Property rights create incentives for efficient exchange and production by assuring that owners have exclusive rights to the resulting profits.

Comments & Discussion 2

- ♦ Economists have argued that property rights emerge when the gains from instituting a system of rights exceeds the costs of enforcement.
- ♦ Private enforcement of property rights often precedes state (government) enforcement.
- ♦ The Coase Theorem forms the core of the economics of property law (and of economics of law in general).
- ♦ It says that when transaction costs are low, the final allocation of resources will be efficient regardless of the initial assignment of property rights.

Comments & Discussion 3

- ◆ The Coase Theorem, when applicable, implies the law is irrelevant with regard to efficiency.
- ◆ This result mirrors the First Fundamental Theorem from welfare economics (competitive market will lead to the efficient allocation of resources regardless of the initial distribution of wealth).
- ◆ The final distribution of wealth, however, *does* depend on how property rights are initially assigned.
- ◆ This mirrors the Second Fundamental Theorem (any efficient allocation can be achieved by a suitable redistribution of the initial assignment of rights.)

Comments & Discussion 4

- ◆ When transaction costs are high, the initial assignment of property rights matters for efficiency.
- ◆ This is true because not all value-enhancing trades will occur. In this case, legal rules replace markets as the primary means of allocating resources.
- ◆ The assignment of rights can be protected by *property rules* or *liability rules*.
 - ◆ Property rules give owners the right to refuse any unacceptable offers to buy their rights, while
 - ◆ liability rules only entitle them to seek compensation after the fact for seizures of their rights.

Comments & Discussion 5

The Coase Theorem says that when transaction costs are low, the allocation of resources will be efficient regardless of the initial assignment of property rights.

Another way to say this is that parties to a legal dispute will resolve the dispute efficiently regardless of the background legal rule. This represents a market solution to the dispute.

When transaction costs are high, however, the parties will rely on the court to dictate a resolution. That is, a court-imposed (involuntary) transaction will replace a market (voluntary) transaction.

Comments & Discussion 6

- ♦ The doctrine of *fair use*, however, allows some unauthorized copying for educational or private use.
- ♦ The economic justification for fair use is that it allows copying that the copyright holder would have consented to in a world of zero transaction costs.

Comments & Discussion 7

When property rights to a resource are awarded on the basis of first possession, there often emerges a race to acquire those rights, which results in excessive depletion of a resource—the so-called tragedy of the commons.

An example is when excessive fishing depletes the stock of fish too quickly. One way to deal with this problem is to set a legal limit on a fisherman's catch in order to prevent over fishing.

Comments & Discussion 8

- ◆ Leases allow property owners to divide their rights to use of their land (or other assets) over time. Leases have historically occupied the nexus between contract and property law.
- ◆ Because leasing arrangements divide ownership and use, they potentially lead to inefficient use of an asset, the so called *rental externality*.

Comments & Discussion 9

- ◆ The rental externality refers to the moral hazard problem created by the divided ownership and control of an asset (like a house) under a lease.
- ◆ Because lessees (tenants) do not have a claim on the asset's value after the lease expires, and because they believe they can conceal some damage that they cause, they have an incentive to overuse or under maintain the asset relative to what an owner would do.
- ◆ Contracts can allocate rights and outcomes to moderate this problem, how to do this is what contract theory is about

Comments & Discussion 10

- ◆ *Sharecropping* represents a traditional institution, a contractual response to inefficiencies associated with divided ownership of agricultural land, sacrificing risk sharing to provide incentives.
- ◆ One function is to share risks of uncertain output between landlords and tenants; but owner is typically wealthier and less averse to risk, so she should bear it all.
- ◆ The other, however, is to provide both parties incentives to supply inputs into agricultural production, limiting the rental externality, and that is controlled by the tenant.