Public Choice: The Coase Theorem

"*In the absence of Transactions and bargaining costs, affected parties to an externality will agree on an allocation of resources that is both Pareto optimal and independent of any prior assignment of property rights*." Public Choice II: pg 28

Why the Coase theorem?

Coase developed his theory at least in part in response to problems with Pigovian taxes.

The Political problem with a Pigovian tax – even after the tax is imposed, and the social cost of the negative externality is brought into line with the social benefits of the activity, the voters who were being negatively affected are still being negatively affected.

No guarantees the political process will then compensate them

Additionally, there is the information problem

How does the rational, public spirited economist, actually determine the costs and benefits of the activity, when there is no market to tell use costs and benefits?

The problem with "shadow prices".

Regardless of what the Benevolent-Despot Economist proposes, modern liberal democracies don't give economists these powers – the power to make these decisions resides with Judges and the Judicial System.

The Judicial System

Incentives in the judicial system work differently.

Rules about perjury, lying, keeping inadmissible evidence out the system, etc.

The rules are there to create countervailing incentives

The reason for this, is that often the incentives are much more to lie in court than in a market

(most of my lawyer friends find this statement to be incredible)

Markets are like a repeating PD game, bad behavior is punished….

Courts are like a one time PD game, the dominant strategy is to defect.

Judges are disinterested – for very good reason. But often, that also means they are ill-informed

(Most of my lawyer friends believe this to be true. No judge ever does)

And the people who are providing Judges with information, have strong agendas

A Simple Example of a Court Imposed Technical Solution

A train has been build that goes through a farm in rural Thailand. However, the train gives off sparks, which cause damage to the farm. The farmer takes the train owner to court, and sues him for damages. In the common law system, if this had not already been decided by previous courts, a judge would have to rule on this issue. For simplicity, assume the judge tries to find the most economically efficient solution, and he uses some version of Learned Hand (a famous U.S. Common Law Judge – pioneered economic theory in the analysis of tort cases). He could order the train shut down, or to put spark suppressors on the side of train, or he could order the farm shut down, or for the farmer to put up a fence that protects his fields from damage. All of this would be done to maximize societies output, i.e. to achieve economic efficiency.

What are the relative costs and benefits. After asking the farmer about the costs and benefits, the judge finds the following costs and benefits.

Cost and Benefits	
Benefit of Train	5,000 Baht
Benefit of a Farm	1,000 Baht
Damage Sparks Cause to Farm	500 Baht
Cost of Spark Suppressors (to train)	300 Baht
Cost of a Fence (to Farmer)	400 Baht

A judge might use the simple equation, "B < PL, where B = the burden (economic or otherwise) of adequate protection against foreseeable damages, P = the probability of damage (or loss) occurring and L = the gravity of the resulting injury (loss)" (this equation is taken from Wikipedia here, a fuller explanation will be covered in your "Law and Economics" class). Setting P = 1, we are looking at burdens and losses. The burden to the farm is 500 baht, and we can avoid the damage at a cost of 300 baht, by making the train put spark suppressors on the train.

Society gets the benefits of both the farm and the train (5,000 plus 1,000), less the cost of the suppressors (-300), for a net of 5,700 baht.

The Information Problem

The above presents the nice, neat numeric examples of the Coase Theorem that are so beloved of economists and public policy wonks. But of course, these numbers have to come from somewhere, and in the above I simply asked the farmer. A farmer who claims his farm is worth a great deal of money, that the train is causing huge fires that burn down his house, damage that he can't avoid because the only fence that can stop the sparks would be the great wall of china, and besides the train owner is really, really rich, and could stop causing damage easily since anti-spark devices are so cheap.

A fair judge would of course ask the Train Owner, and might get something like column three.

Cost and Benefits	According to the Farmer	According to the Train Owner
Benefit of Train	5,000 Baht	3,000 Baht
Benefit of a Farm	1,000 Baht	100 Baht
Damage Sparks Cause to Farm	500 Baht	50 Baht
Cost of Spark Suppressors (to train)	300 Baht	700 Baht
Cost of a Fence (to Farmer)	400 Baht	25 Baht

Note now the Judge has a completely different set of numbers to work with. If the judge uses the train owners numbers, he should tell the farmer to put up a fence, at a cost of only 25 baht. A very different solution.

This illustrates the problem with Judges finding technical solutions to externality problems. The two parties who know the most about the problem, the farmer and the train owner, have very different incentives. The farmer in this example wants to exaggerate how important his farm is, how much damage he is taking, how hard it is for him to avoid, and how easy it is for the train to avoid it. The train owner has opposite incentives.

Our judges decisions will only be economically efficient only to the extent that he can get "perfect information" about the true costs and benefits before him.

Enter Coase……

Coase asked what would happen if instead, we simply assigned a property right to one or the other of these two. What he found, was that absent transaction costs, the two would create a mutually beneficial agreement that would maximize economic efficiency, so long as the property rights were clear and unambiguous. (recall the definition of a property right, -- you can deny it to others, you can use it yourself, and you can sell it to others). Let us assume that the Judge believed the Farmer in the above case, but the farmer was lieing, in actuality the train owner was telling the truth. None-the-less, the Judge assigns the farmer the property right.

So the Train prepares to spend 700 baht installing spark suppressors, even though the farmer's farm is only worth 100 baht, the sparks only cost the farmer 50 baht, and the farmer could build a wall for 25 baht that would protect him. The farmer has a different incentive, now he goes to the train owner and says "hey, if you pay me xxx baht, I will allow you to put sparks on my land". If his offer is below 700 baht, the train owner has an incentive to accept. Lets say they settle on 300 baht. The train owner saves 400 baht, and the farmer earns 300 baht, less the 50 baht in damage, or 250 baht net. Of course, the farmer can avoid the 50 baht damage by building a wall for 25 baht, so he would do that as well. The 300 baht the train gives the farmer is NOT a loss to society, it is simply a transfer from one person to another.

What if the property right was instead assigned to the train? Then the train can put sparks out as it wants. The train will never accept less than 700 baht (his true cost of avoiding the damage), so the farmer will say "to hell with that, I am just going to build the 25 baht wall. Same result, except now there is no transfer.

Some other examples:

The worthless farm
In this example, the sparks do more damage than the farm is worth. Give the right to the train, and the farmer will move away, because the farm is so marginal anyway. Give the right to the farmer, and the train will transfer between 200 and 300 to the farmer, who will then move away.

Cost and Benefits	Actual costs
Benefit of Train	5,000 Baht
Benefit of a Farm	200 Baht
Damage Sparks Cause to Farm	500 Baht
Cost of Spark Suppressors (to train)	300 Baht
Cost of a Fence (to Farmer)	400 Baht

The worthless train
Now it is our train that is of little benefit. If the farm gets the property right, the train simply does not get built. If the train gets the right, the farmer will transfer between 100 and 200 to the train, but no more.

Cost and Benefits	Actual costs
Benefit of Train	100 Baht
Benefit of a Farm	200 Baht
Damage Sparks Cause to Farm	500 Baht
Cost of Spark Suppressors (to train)	300 Baht
Cost of a Fence (to Farmer)	400 Baht

The Cheap spark Suppressors
No matter who gets the property right, the train just builds the spark suppressor, though the farmer may end up transferring between 200 and 400, if the right is awarded to the train. (why?)

Cost and Benefits	Actual costs
Benefit of Train	5,000 Baht
Benefit of a Farm	2,000 Baht
Damage Sparks Cause to Farm	500 Baht
Cost of Spark Suppressors (to train)	200 Baht
Cost of a Fence (to Farmer)	400 Baht

Few Sparks
What if the sparks do very little damage? If the right is awarded to the train, the farmer just tolerates 50 baht of damage to his farm. If the right awarded to the farmer, the train owner will compensate him, some amount between (how much?) and (how much?).

Cost and Benefits	Actual costs
Benefit of Train	5,000 Baht
Benefit of a Farm	2,000 Baht
Damage Sparks Cause to Farm	500 Baht
Cost of Spark Suppressors (to train)	200 Baht
Cost of a Fence (to Farmer)	400 Baht

Objections and limitations to the Coase Theorem.

The Coase Theorem seems to show that Pigovian taxes are not necessary, that markets can handle externalities themselves. Many have objected to the Coase theorem, including Coase himself, who in his original article was talking about transaction costs. Others have since added other objections. These objections include…

- Transaction costs
  - Negotiating is not a costless activity
    - Lawyers, estimates, time, etc.
    - More people will mean greater time spent
  - esp when property rights are not clear…
    - Can I "sell" an increased chance of death or harm to somebody?
      - Example, construction workers, safety regulations
- Strategic Behavior
  - We have been assuming that the farmer and train operator become honest
    - After the property right is established
  - Not necessarily true. The range within which to lie has decreased, but lieing can still pay
    - Example: the worthless train;
      - our train owner still has an incentive to exaggerate the value of the train
- The hold-out problem
  - As more people become involved in negotiations, the incentive to "hold-out" increases
    - Example: grandpa Simpson and a road between Tha Phra Chan and Rangsit
  - The Coase Theorem requires unanimity, with all the problems that entails
    - Eminent domain, the "laws of takings"

The transaction costs issue is a serious one for the Coase theorem

- But the same can be said for the U.S. courts.