ECON 522 - SECTION 2 - THREAT POINTS, COASE THEOREM AND TRANSACTION COSTS

I. Threat Points

Often when doing a bargaining problem it's important to calculate threat points. An individual's **threat point** is the payoff they can guarantee themselves by not participating in a bargain. When defining threat points and payoffs for a problem, in some sense the initial value you pick for a threat point is arbitrary, since what we really care about is the *relative* payoffs between different options. By this I mean that if payoffs have not been given to you, you're free to specify any payoff you want for a specific allocation, as long as you consistently compare payoffs to other allocations relative to this initial specification. The following example should help illustrate the point.

I.1 Example: Buying a Car Bob owns a car which he values at $4,000. Hal has $15,000 and needs a car to get to work, an he values Bob's car at $7,000. (1) What are Hal and Bob's threat points? (2) What are the potential gains form trade? (3) What price would they agree to and what would their payoffs be if they decided to split the gains from trade?

1. Since Bob starts with a car which he values at $4,000 it seems reasonable to say that his threat point is $4,000. Likewise, since Hal starts with $15,000 it's reasonable to say that that is Hal's threat point.
   Bob's TP: $4,000; Hal's TP: $15,000

2. The potential gains from trade are the increase in total social welfare if a trade took place, which is the difference in how much Hal values the car versus Bob, which is $7,000-$4,000=$3,000.
   Gains from Trade: $3,000

3. If they split the gains from trade then they should each get half of the gains from trade *more than their threat points* as payoffs. Thus each gets $\frac{1}{2}(\$3000) = \$1,500$ above their threat points, which is $4,000+$1,500=$5,500 for Bob, and $15,000+$1,500=$16,500 for Hal. The price they agree to leaves Bob with a $5,500 payoff, so we know that:

   $$\text{Bob's Threat Point } - \$4,000 + p = \$5,500$$

   So $p = \$5,500$ (the -$4000 is because Bob is giving up his car which he values at $4,000). Let's check that that makes sense for Hal's payoff being $1,500:

   $$\begin{aligned}\text{Hal's payoff } &= \text{ Hal's threat point } + \$7,000 - p \\ &= \$15,000 + \$7,000 - \$5,500 \\ &= \$16,500\end{aligned}$$

   p $= \$5,500$; Bob's payoff: $5,500; Hal's payoff: $16,500

Alternative Solution

1. Since Bob and Hal don't gain or loose anything from not bargaining, let's say both of their threat points are \$0.
   Bob's TP: \$0; Hal's TP: \$0

2. The potential gains from trade are the increase in total social welfare if a trade took place, which is the difference in how much Hal values the car versus Bob, which is \$7,000-\$4,000=\$3,000.
   Gains from Trade: \$3,000

3. If they split the gains from trade then they should each get half of the gains from trade *more than their threat points* as payoffs. Thus each gets $\frac{1}{2}(\$3000) = \$1,500$ above their threat points, which is \$0+\$1,500=\$1,500 for Bob, and \$0+\$1,500=\$1,500 for Hal. The price they agree to leaves Bob with a \$1,500 payoff, so we know that:

$$\begin{aligned} \text{Bob's Threat Point } - \$4,000 + p &= \$1,500 \\ \$0 - \$4,000 + p &= \$1,500 \end{aligned}$$

   So $p = \$5,500$. Let's check that that makes sense for Hal's payoff being \$16,500:

$$\begin{aligned} \text{Hal's payoff } &= \text{ Hal's threat point } + \$7,000 - p \\ &= \$0 + \$7,000 - \$5,500 \\ &= \$1,500 \end{aligned}$$

   p $= \$5,500$; Bob's payoff: \$1,500; Hal's payoff: \$1,500

In both solutions we get that $p = \$5,500$, and the gains from trade are \$3000, even though we used different threat points in the two problems. This will always be the case, no matter what numbers you pick for threat points. When dealing with payoffs (utility), the payoff form one outcome is only meaningful when comparing it to other outcomes. No matter what initial payoffs you pick for Hal and Bob (i.e. what threat points you assign), you will always find that they are each \$1,500 better off after trading and splitting the gains evenly. This is because the values that they each assign to the car, \$4,000 and \$7,000, are absolute and cannot be arbitrarily assigned. Of course, some threat points are more natural picks than others. Generally is easiest to assume the threat point of the person originally holding the object in question is whatever he values that object at (e.g. Bob's TP=\$4,000).

II. Coase Theorem

The point of the Coase Theorem is that *if there are no transaction costs*, then as long as property rights are well defined and tradable, then for *efficiency* it doesn't matter who owns property rights initially: people will trade with each other until the individuals who value certain property the highest own that property (this is the intuition behind Adam Smith's "invisible hand" of the market). However, even with zero transaction costs, who has initial property rights definitely matters for distribution; if I own a car that you value more, I will sell you the car and earn a profit, but it is just as efficient for you to own the car in the beginning and reap the entire surplus, leaving me with no wealth.

III. Transaction Costs

Think of transaction costs as anything that makes it difficult to trade, or as any cost you have to pay that you're not exchanging for something you value. For example, if you want to buy a car you have to find someone to buy it from. Searching for a seller is a real cost, but you don't really gain any value from paying that cost; you would have had higher net utility making the same purchase if you didn't have to search for a seller. There are three cost categories:

- **Search:** you have to find someone to buy from, educate yourself about a product, etc.
- **Enforcement:** there must be ways to enforce the laws governing property rights and exchange.
- **Bargaining:** this seems to be most relevant for the property rights segment of our class.
  - **Private information** is when individuals have secret but symmetric information, such as their own valuations.
  - **Asymmetric information** is when one individual has more/less information than the other.
  - **Uncertainty** about the law and property rights can be a problem (one way to reduce this transaction cost is by relying on *precedent* in rulings).
  - **Large numbers of people** can also lead to problems. Example- Smoking bans in bars: As far as the Coase Theorem is concerned, who has smoking rights is irrelevant for efficiency, but since there would be many people involved in any negotiation for smoking rights in a public area, it may be more efficient for the government to try to give the rights to the people who value them most.

III.1 Example from class: Electric Plant v. Laundromat

Take a look at the example from class with the electric plant and the laundromat. The story is that the electric company pollutes, and the pollution reduces the laundromat's profits from \$300 to \$100. Meanwhile, the electric company has profits of \$1000. In order to stop the pollution, either the electric company can install filters on its smokestacks, at a cost of \$500, or the laundromat can install filters in its vents at a cost of \$100. Look at the notes to see the payoffs.

Things to note:

- The electric company prefers the world where it has the right to pollute, but after that it prefers the world in which it has to pay damages rather than the world in which the laundromat has an injunction right to shut down the plant. The reason is that having to pay damages gives the electric company more options versus facing an injunction; it can choose to pollute and pay damages, or install the filters itself, or negotiate to have the laundromat install filters. When facing the injunction it can only negotiate or install the filters (or shut down).
- The laundromat prefers the world in which it has the injunction right to the world in which the electric company must pay damages. This is for the exact same reason that the electric company prefers the opposite.
- As Coase explains, as long as the two parties can negotiate, and transaction costs are low, the efficient outcome results (in this case any outcome with \$1200 total profit is efficient). The reason is that no matter what, the laundromat will install filters in the efficient situation: if the polluter has rights to pollute, the laundromat will install filters at cost to itself, and if there are injunction/damages rules, then the electric company will realize that it's cheaper for the laundromat to install filters, so it will pay the laundromat to do so.