FE486A: Law and Economics

Homework 1

Due January 28th

**31 points possible:**

**Please indicate the students that you worked on this homework assignment with, if any.**

1. **(6 points – 2 points each)** For the following games, find the Nash Equilibria and the Pareto optimal outcome.

a)

|  |  |  |
| --- | --- | --- |
|  | X | Y |
| X | 4,4 | -1,5 |
|  Y | 5,-1 | 0,0 |

**Nash Equilibrium (NE) is (Y,Y) and Pareto optimal (PE) is (X,X)**

b)

|  |  |  |
| --- | --- | --- |
|  | X | Y |
| X | 4,4 | 5,-1 |
| Y | -1,5 | 0,0 |

**Nash Equilibrium (NE) is (X,X) and Pareto optimal (PE) is (X,X)**

c)

|  |  |  |
| --- | --- | --- |
|   | X | Y |
| X | 3,3 | 4,4 |
| Y | 4,4 | 0,0 |

**Nash Equilibrium (NE) are (X,Y) and (Y,X) Pareto optimal (PE) are also (X,Y) and (Y,X)**

1. **(6 points – 2 points each part)** Over Christmas break, Abe (a Naval Academy midshipman) presented his girlfriend Beth with an engagement ring. However, shortly after graduation the quarreling began. The relationship deteriorated until, in a fit of anger. Abe, naturally, broke off the relationship and asked for the return of his ring. Beth replied that it was a gift to her and she was not about to return it. He answered that he had only loaned it to her to wear until they got married. Abe and Beth are now involved in a legal dispute over the ring. Beth possesses the ring and she declares that she intends to sell it. Abe threatens to sue her. If Abe wins at trial, the court will require Beth to return the ring to him. The ring is worth $2,000 to Abe. If Beth wins at trial, the court will allow her to keep the ring. She would then sell the ring for $800 to an acquaintance. (The acquaintance does not know Abe and will not resell the ring to him.) In the event of a trial, each one expects to win with probability 0.5. A trial will cost Abe $500 and it will also cost Beth $500. (Hint: Use expected values).

a) Will Abe want to settle or would he be willing to take Beth to court? Explain numerically .

**Abe would be willing to settle or take his chances in court:**

**EV =**

b) Will Beth want to settle or would she be willing to take Abe to court? Explain numerically.

**Beth would be willing to settle and NOT willing to take her chances in court:**

**EV =**

c) What is the minimum and maximum settlement price Abe would be willing to pay Beth to

have the ring returned to him?

**Abe would be able to pay $0 (in expectation Beth loses $-100). The most he’d be willing to pay is $1500.**

1. **(2 points)** You are being sued for damages over a lost beer you allegedly took at a bar. If you lose, you must pay $2 to reimburse the plaintiff for the lost drink. If you win you are paid $2 (recovery for nuisance lawsuits). There is a 50/50 chance you win or lose, thus your expected monetary payment or recovery in court is $0. Your current level of Wealth, W, is $2, and your Utility function is U(W) = W½ (square root of W), i.e. if you lose the case: U = U($2-$2) =U($0) = 0, but if you win: U = U($2+$2) = U($4) = 2 . What is the maximum cash you would be willing to pay to settle out-of-court ex ante, i.e. maximum cash you would be willing to pay to have the lawsuit dropped to avoid taking your chances in court? (Hint: Find the expected utility for not settling, using wealth with having to pay and wealth with recovery).

**EUnot settle = prob(lose)\*U(wealth-reimburse)+prob(win)\*U(wealth+nuisance recovery)**

**EUnot settle = =1**

**To avoid the lawsuit:**

**EUavoid = U(keep wealth – settlement) would be equal to EUnot settle**

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**So you are willing to pay $1 to settle out of court.**

1. **(4 points – 1 point per line)** Fill in the blank with the appropriate economic language/concept.

Bill owns an old car he values at $1,000. Jane values Bill's car at $1,200.

***Without Transaction Costs:***

The (Pareto) efficient allocation requires the car to go to \_\_\_**Jane**\_\_\_\_\_\_\_

There is a cooperative surplus of \_\_\_$**200**\_\_\_\_\_\_\_\_

***With Transaction Costs:***

Now suppose that there are transaction costs, e.g. it costs $250 in fees to transfer title of the car from one party to another (or equivalently, Bill and Jane do not know each other and it costs $250 to place advertisements to find each other).

Efficiency requires that \_\_**Jane**\_\_\_\_ gets the car.

Mutually beneficial exchange \_**will not**\_\_\_ (will/will not) occur based on initial property rights.

1. **(6 points – 2 points each)** Should we protection the following interests by an injunction or damages? Explain.

a) A land owner’s right to exclude from his property a neighbor’s gas line.

**An injunction. There are two parties involved, so, presumably, the transaction costs between them to negotiate an easement for the neighbor’s gas line should be small.**

b) A new car owner’s right to have her car’s defective transmission replaced by the seller.

**This is actually a subtle question. Normally, one would say that the car owner ought to have the right to have his defective transmission replaced—that is, he or she ought to have the equivalent of a property rule running in his favor. If, then, the seller wanted to try to bargain ought of this obligation, that would be fine because the seller would have to offer the car owner enough compensation to make him or her indifferent between having the transmission replaced or not. But it is possible that the seller, if required to replace the transmission, might misbehave in some way that would require someone – perhaps a court – to supervise what he or she was doing to the car. If those supervisory costs are sufficiently high, then it might be better to have the seller pay the buyer compensatory money damages.**

c) a homeowner’s right to be free from air pollution by a nearby factory.

**The transaction costs between a single homeowner and the factory might be low, but there may be lots of homeowners who are affected by the pollution. If so, then the total transaction costs of internalizing the external costs that the pollution imposes may be so high as to argue in favor of compensatory money damages instead of an injunction. You might also talk about the possibility that a regulatory solution—having an administrative agency set pollution limits on the factory and then monitor compliance—might be superior to a private law solution (in which the homeowners bring a nuisance action against the factory.).**

1. **(7 points)** A rancher and a farmer live next door to one another. Although the boundaries of their properties are well defined, there is no fence or natural break that clearly demarcates the boundaries. As a result, from time to time the rancher’s cattle stray onto the farmer’s property.

Assume that if the rancher’s cattle stray onto the farmer’s property, the farmer loses $60 in profits per year; that the annual cost to the rancher of building and maintaining a fence between his property and the farmer’s is $120; and that the annual cost to the farmer of building and maintaining a fence between his property and the rancher’s is $95. Assume that the transaction costs between the rancher and the farmer are zero.

**Show the matrix (1 point)**

|  |  |  |
| --- | --- | --- |
| Rancher (row)\Farmer (column) | Fence | No Fence |
| Fence | -120, -95 | -120,0 |
| No Fence | 0, -95 | 0, -60 |

Compare the efficiency of these three legal regimes: Be sure to indicate, 1) if a fence is built and 2) if so, who pays and if not, how an efficient outcome is reached **(2 points each)**

a. **farmers’ rights:** the farmer has a legally-enforceable right to be free from invasion; in the event of invasion, he is entitled to compensation in the form of his lost profits.

**No fence; rancher pays $60 to farmer and is the efficient outcome**

b. **ranchers’ rights:** the rancher bears no liability for any damage that his cattle may do to someone else’s property.

**No fence; farmer loses $60 (which is better than losing $95) and is the efficient outcome**

c. **farmers’ super-rights:** the farmer has a legally-enforceable right to be free from invasion; in the event of invasion, he is entitled to *ten times* his lost profits.

**Note that if the Coase Theorem holds, the outcome under the three different legal regimes should be the same (or, to be completely accurate, equally efficient—although in this instance, the outcomes are, in fact, identical).**

**Under *farmers’ super-rights* there will be no fence, even though the farmer might receive ten times his actual losses ($600) in the event of an invasion. The rancher can induce the farmer to do better by accepting a payment of between $60 and $95. Why will the farmer accept that? Because if he does not, the rancher will build a fence, in which case the farmer will receive only $60 in additional profits and is the efficient outcome.**