EE403 Law and Economics
Semester 1/2015
Mid-Term Examination

Date: Wednesday 7 October 2015
Time: 14:00-15:30 hrs.

Instructions:

1. There are two essay questions with a total of 30 points.
2. Write your answers in the provided booklets.
3. Books, notes, calculators and electronic devices are not allowed.
4. Use pens to write your answers; pencils are allowed for drawing only.

Questions:

1. Why is it said that information has some features of a public good? And what is the result of such features on the efficient allocation of resources? What are possible remedies provided by society for such problem? (10 points)

Answer: Information contains ideas. The value of information is its credibility. It has certain features of a public good:

- Non-rival consumption: one person's use of an idea does not preclude others.
- Non-excludability or non-appropriability: to exclude other people is costly as transmission is cheap.

Information tends to spread and cannot be appropriated by individuals. It is also costly to produce, but cheap to transmit. So every buyer can be a potential competitor with the low cost of transmission, not production. Buyers have incentives to become 'free-riders'. The producer can be undercut by buyers who turn into resellers.

So information suffers the same problem of public goods: the private market supplies the below-efficient level of output.

There are four possible ways for society to solve the undersupply problem:

1. The state supplies or subsidizes art and science, especially basic research such as universities and research institutions owned or subsidized by the state.
2. Charitable contribution by wealthy people. This is voluntary contribution to the arts and sciences with the incentive by tax deduction of charitable donations from the donor's taxable income.
3. Trade secrets protection**:** an employee or contractor signs a *non-disclosure agreement (NDA)* not to disclose any of the company secrets.
4. **Intellectual property (IP) law**: patents, copyrights and trademarks.

2. Suppose that a railroad runs beside a field in which commercial crops are grown. The railroad is powered by a steam locomotive that emits sparks out of its smokestack. From time to time, those sparks land on the crops near the track and burn them. Assume the following:

- Each year, the farmer whose crops are burned loses $3,000 in profits.
- The annual cost to the railroad of installing and maintaining a spark-arrester that would prevent any damage to the crop is $5,000.

Use the information above to answer the following two questions:

Question 2.1: Assuming zero **transaction costs**, use the **Coase Theorem** to analyze the effects of the two different legal rules on the efficient outcome (10 points):

Rule 1: The law protects the farmer from invasion by sparks.
Rule 2: The law allows the railroad to emit sparks without liability.

Which rule is the more efficient in terms of resource allocation?

Answer to 2.1:

The Coase Theorem states that, when transaction costs are zero, an efficient use of resources results from private bargaining regardless of the legal assignment of property rights.

Rule 1 means that the farmer has the right to his crops and safety from sparks. The railroad has two choices:

a) to install a spark-arrester at a cost of $5,000.
b) to avoid installing a spark-arrester (and to continue emitting sparks) by offering at least $3,000 to farmers but no more than $5,000.

With zero transaction costs, the railroad can bargain with the farmer and will choose option b. The railroad's threat value is to pay no more than $5,000 while the farmer's threat value is to accept no less than $3,000. The surplus from cooperation is $5,000-$3,000 = $ 2,000. If the parties agree to split the surplus in half, the railroad will pay $3,000 + $1,000 = $4,000 to the farmer and save up $1,000 by not installing a spark-arrester.

Rule 2 means the railroad has the right to emit sparks and the farmer must bear the cost of the damage at $3,000. The farmer has two choices:

a) to suffer the crop damage of $3,000, or
b) to offer to pay at least $5,000 for the railroad to install a spark-arrester (so as to stop emitting sparks).

As the resource (the right to emit sparks) already belongs to the one who values it the most ($5,000 for the railroad against $3,000 for the farmer), **there is no need for private bargaining.** The farmer will continue to suffer the crop damage as the least-cost choice.

Both Rule 1 and Rule 2 are equally efficient in terms of resource allocation, i.e., a spark-arrester will not be installed. The only difference is how the surplus is shared and who will bear the cost of crop damage. In Rule 1, the railroad bears the cost of crop damage and the surplus is shared by both parties. In Rule 2, the farmer bears the cost while the surplus is appropriated wholly by the railroad.

Question 2: But if **transaction costs are high** (so that private bargaining is not possible) and the law protects the farmer from invasion by sparks (**Rule 1**), analyze the effect of **the following remedies granted by the court** on the outcome of the dispute (10 points):

a) Railroad pays **future damages** to the farmer or stops emitting sparks.
b) A court **injunction** for the railroad to stop emitting sparks.

Which remedy is the more efficient in terms of resource allocation? And explain your reason why that particular remedy is more efficient than the other.

Answer to 2.2:

When transaction costs are high, parties to the dispute cannot bargain and must resort to a lawsuit. Rule 1 means the farmer has the clear right to safety from sparks while the railroad is liable to any damages to the farmer or must be subject to an injunction (not to emit sparks).

a) If the court requires the railroad to pay damages to the farmer, the amount of damages is $3,000 (which is actually the price of the farmer's right to safety from sparks). Or the railroad can avoid paying such damages by installing a spark-arrester at a cost of $5,000. So the railroad will minimize its costs by paying $3,000 damages to the farmer and will not install a spark-arrester.
b) The injunction is equivalent to a clear assignment of property rights without the court setting the price of such rights. With high transaction costs and no private bargaining, the railroad must stop emitting sparks by installing a spark-arrester at a cost of $5,000 while the farmer saves up $3,000 from the crop damage.

Therefore, **damages as a remedy are more efficient**. It minimizes costs for society at the crop damage of $3,000 rather than paying for a spark arrester of $5,000. The railroad will pay $3,000 damages to the farmer and will not install a spark-arrester. The reason is that damages (Choice a) allow the railroad to make decision on the most efficient way to internalize the crop damage. So it will choose the solution which minimizes its private cost

(and costs to society) whereas the injunction leaves the railroad with no choice other than installing a spark arrester, which is more expensive and not efficient.

The only difficulty with damages as a remedy is that the court must incur **low information costs** in finding out the exact amount of damages. For example, if the court sets too high damages at $6,000, the railroad will choose to install a spark arrester (at $5,000) which is more expensive than the actual crop damage to the farmer (at $3,000). Efficiency will not be achieved.