

EE403 Law and Economics
Semester 1/2016
Mid-Term Examination

Date: Wednesday 4 October 2017

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. What are the two different rules for the assignment of property rights on fugitive property? How are they applied in different cases? Explain and compare their benefits and costs?

Answer:

The two different rules are the rule of first possession and the rule of tied ownership.

The rule of first possession states that the thing is not the property of anyone until reduced to **actual possession** (by capture, extraction, act of pursuit with intention). The rule is applied in the early stage of exploration or development where resources are abundant and remain unclaimed. It is also applied to inventions of which ownership is assigned to the first inventors. The rule has the benefit of the low cost of determining ownership rights as it is relatively cheap to identify who has the first access. However, the rule also encourages uneconomic, wasteful investment to claim ownership in order to preempt others from claiming ownership of the same resource. Such 'preemptive' investment only transfers ownership without efficiency gains because it does not generate wealth to society.

The rule of tied ownership ties the ownership of the fugitive property to settled property. The rule is qualified by **the principle of accession** which states that the new thing is owned by the owner of *the proximate or prominent property*. The benefit of the rule is that there is no gap in ownership claims as long as the ownership in settled property is already established, i.e., the owner of the prominent property is also the owner of the fugitive property, such as trees on the farm land, fruits from a tree, the offspring of the cattle, returns on financial investment, etc. There is no transfer effect and overinvestment on the resource as in the case of the first possession rule. But the rule is costly to administer for moving objects such as underground natural gas, water, and unclaimed, wild resources because of the lack of the uncertainty in the ownership of prominent property.

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.

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 Question 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 2.2: 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**), what is 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 Question 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 for society.

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.