

**Economics 1450**  
**Law and Economics**  
**Professor Berkowitz**  
**Spring 2005**

April 5, 2006

Problem Set 5

We will work on this problem set for the rest of the term. You are not expected to hand in this problem set. But, you should view this problem set as critical preparation for the final exam. If we do not cover a particular problem in this problem set in class, then you will not be responsible for it on the final.

1. Chapter 6, exercises 6.1, 6.2 and 6.3
2. Chapter 6, problems 2, 3, 4 and 5.
3. Explain how control and ownership has evolved in the Russian oil industry following the Russian privatizations in the 1990s. Using the data from the Berkowitz and Semikolenova (2006) paper, show that export capacity has been inefficiently allocated to crude oil exporters. Explain why a Coasian bargain between companies and the state that would achieve efficient outcomes is problematic.
4. Using the model from the Berkowitz and Semikolenova paper, explain why we would expect that a company such as LUKOIL that has a influential state presence on its board would get more export quotas than a company such as YUKOS.
5. Chapter 7, exercises 7.1 and 7.2
6. Chapter 7 institutional issues: adverse possession, the mistaken improver problem; inheritance rules, the eminent domain clause, just compensation.
7. Chapter 7: suppose a land investor is deciding whether to upgrade a plot of land that she believes he owns with probability  $p$ :  $0 < p < 1$ . Thus, her neighbor owns the land with probability  $1 - p$ . The land investor can either choose to conduct a survey (that establishes just whether or not she is the true owner) at a cost  $s$  before she decides to invest in the land; or, she can forego this survey and invest in improving the land. Show how the “owner’s option” rule gives the improver the socially efficient incentives to conduct a survey (this is based on section 1.2).
8. Chapter 7, problems 2, 3 and 4.

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Problem Set 5, selected answers

Chapter 6, problem 1, see answers on Micelli on pp. 329-331.

Chapter 6, problem 2, part a: social surplus is highest and equals  $200 - 125 = 75$  when there are two trains.

Part b (i): Suppose that social surplus is divided evenly (and use this rule in all subsequent problems when there is bargaining). Since the railroad has the property rights, it is entitled to maximize its profits and operate 2 trains. By inspection, note that there is no deal that the farmer can offer the railroad to reduce the number of trains. Thus, the resulting returns are:

Farmer:	-\$125.00
Railroad:	\$200.00
Social Surplus:	\$75.00

Part b (ii): Since the farmer has the property rights, she is entitled to no damages (zero trains). Both the farmer and railroad earn zero profits when there are zero trains and 75\$ of surplus is available which is split when they reach a bargain to allow 2 trains to run. The resulting returns are:

Farmer:	\$37.50
Railroad:	\$37.50
Social Surplus:	\$75

Part c (i): Suppose damages are correctly set at marginal cost (note that there are other possible answers, but this approach is one that will yield an efficient outcome). When the railroad is assigned property rights, damages equal the marginal loss in profits and when the farmer is assigned rights, the damages are the marginal fire damages:

No. of Trains	Damages when railroad has property rights	Damages when farmer has property rights
0	\$50	
1	\$100	\$100
2		\$25

If the railroad has the property rights, the farmer will never pay out damages and the number of cars remains at 2. Moreover, it is hard to imagine just how the farmer could infringe on the railroad's rights to run as many trains as it want. The resulting outcomes are described in part b (i).

Part c (ii): If the farmer has the property rights, then the railroad will pay out the damages of \$100 to be able to run 1 train and then an additional \$25 to run the second car. The resulting returns are:

Farmer:	$\$100 + \$25 - \$125 = \$0$
Railroad:	$\$200 - (\$100 + \$25) = \$75$
Social Surplus:	$\$75$

Note, there are other damage rules that will also work to obtain efficiency, for example, damages paid out to the farmer of \$100 per railroad car.

Chapter 6, problem 3, Part a: According to the Coase Theorem, the assignment of property rights does not matter for efficiency. If the marginal benefit of pigs exceeds their cost in terms of bad smell, they will roam, and if their marginal cost exceeds their benefit, then the pig farm will be shut down. Thus, if the court issues the injunction, it will be bind only when marginal cost exceeds benefit. If the injunction is not issued, then the pigs farm will still be shut down when it marginal cost exceeds it marginal benefit. (NOTE: in answering this question on an exam, it is useful to work out the bargains of lack of bargains the different cases in which the injunction is granted and not granted).

Part b: The court needs to know the sign of  $MB\text{-pigs} - MC\text{-pigs}$  since a bargain cannot be struck. If  $MB\text{-pigs} > MC\text{-pigs}$ , then the injunction should not be issued, and the efficient outcome of roaming pigs is realized. If  $MB\text{-pigs} < MC\text{-pigs}$ , then the injunction should be issued and the efficient outcome of eliminating the pig farm is realized.

Part c: Set damages to the pig farmers equal to the marginal cost that they impose on the residents when  $MB\text{-pigs} > MC\text{-pigs}$ . Thus, the pig farmers will simply pay this to the residents as part of their operating costs. If, however,  $MB\text{-pigs} < MC\text{-pigs}$ , then this damage system would also put the pig farmer out of business, which is socially efficient. In this case, the court must correctly (somehow??) calculate marginal costs borne by the residents. An alternative liability rule which would be easier to calculate is to impose liability damages on the residents for forcing the farmers not to operate. However, it is not clear just how that would be implemented in practice. For example, interpreted literally, the resident would pay damages equal to the marginal benefits of the pig farm when they kill the pigs!

Chapter 6, problem 4, part a: The right to use the dock is assigned to the dock owner and the rule for protecting this right is a liability rule (NOTE: in a good answer on a test, you should explain this in some detail). Part b: The transaction costs of bargaining over the use of the dock during a storm are VERY (!!!) high. And, the value of the boat exceeds

damages to the dock during the storm, so that the liability rule allows the socially efficient outcome to be realized.

Chapter 6, problem 5, part a: Assume a 50-50 surplus split. Each owner can get his/her reservation price for his/her share (\$3,000 and \$6,000) and there is a \$1,000 left over as surplus. Then seller 1 gets \$3,500 and seller 2 gets \$6,500 and the deal goes through.

Part b: The deal does not go through because seller 2 would obtain \$5,000 which is less than his/her reservation price of \$6,000.

Part c: This question is open to some interpretation. Suppose we use the assumptions from part b where the two sellers cannot bargain with each other and each is entitled to one half of the proceeds. Suppose seller 1 can force the sale. Well, he/ will do this under this rule since  $5,000 > \$3,000$ . While seller 2 is unhappy, this outcome is Kaldor-Hicks efficient. If seller 2 can force the sale, he/she will not do this, and the Kaldor-Hicks efficient outcome is NOT realized.

Questions 3&4. See class notes the Berkowitz and Semikolenova paper. We will review this in class.

Question 5, Chapter 7, exercises 7.1 and 7.2, see Micelli, p.331.

Question 6, Chapter 7, problem 2, part a: Social surplus with development is  $50K - (20+15+10)K = 5K$ ; and without development is  $10K$ , so NO development is efficient.

Part b: Suppose the surplus is split evenly. The three residents can unite and offer the developer half the surplus of  $5K$  and keep the other half. Thus, there is no development, and the developer has profits of  $5.2K$  and the residents each cut their initial losses by  $2.5/3 K$  (that is, they share equally in the cut in losses).

Part c: In this case the social cost of organizing dominates any potential gain to the residents and the land is developed.

Part d: The government should employ a liability rule. The most straightforward way to do this is have the developer pay liability damages associated with the development to each resident. In this case, the return to the developer if the land is developed is  $5K$  which is less than the return of  $10K$  if underdeveloped.

Part e: See p.225-236. If there is a taking, then the government regulation of the land is so restrictive that that it causes a decline in the value of the regulated property. Then, regulation is a taking for which compensation is due. So, suppose the government prohibition on regulation lowers the value of the land when it is underdeveloped. Then, the developer should be compensated for this. What is interesting also is if the regulation lowers the value of the land below  $5K$ , so that development becomes the better option.