

Tutorial 10. *Externalities.*

Problem 1. Alfred and Ben own cabins at a lake. Alfred has a Jet Ski that he loves to ride on the lake, which understandably disturbs Ben. Alfred's utility is $U_A = 20\sqrt{x} + C_A$, where x is the number of hours he spends riding the Ski and C_A is the amount of money he spends on all other goods (formally called composite commodity). Ben's utility is $U_B = C_B - x$, where C_B is the amount of money Ben has for his private consumption. Both Alfred and Ben have income of 120 dollars. The cost of one hour of Jet Skiing is 2 dollars.

- (a) If there is no bylaw regarding the noise created by the Jet Skis, how many hours will Alfred spend having fun on his watercraft? (for now assume they do not communicate).
- (b) What is the efficient number of hours that Alfred should spend on the Jet Ski?
- (c) In this particular situation can we expect Alfred and Ben to reach efficient outcome or is government intervention absolutely necessary to guarantee efficiency?

Problem 2. *Externalities, Efficiency, and Property Rights.* Alfred and Ben share an apartment. Alfred likes loud music and Ben does not. Suppose that music imposes an increasing marginal cost on Ben $MEC = Q$ where MEC is dollars and Q is hours of loud music. Alfred's marginal value of each hour of loud music measured in dollars is $MPB = 10 - Q$.

- (a) Represent this situation on diagram. Show efficient consumption of loud music and situation when Alfred listens to loud music as much as he wants.
- (b) Suppose that there are no legal restrictions on volume of music and Alfred has a right to listen to music as loud as he wants and as much as he wants. Ben approaches Alfred with an offer to pay money for reducing the number of hours of the loud music. Will negotiations achieve efficient outcome (assume the cost and benefits are known to both)?
- (c) Suppose Ben has a right for quiet environment. This means that loud music is legal, but Ben has a right to prohibit Alfred from playing music loudly any time. Suppose Alfred approaches Ben with an offer to compensate Ben for each hour of loud music. Will negotiations reach efficient outcome?
- (d) Compare parts (b) and (c) and make a conclusion.
- (e) **Discussion.** This problem is a demonstration of *Coase theorem*. Explain how does Coase theorem apply to the situation described in this problem. Can you think of any reasons why negotiations may fail between Ben and Alfred?