

ECN 371 - Environmental Economics 09:00-12:00 - May 20, 2015

A1: No books except English dictionary, no other aiding tools.

This exam consists of 4 questions, for a total score of 100 points.

All questions are to be answered. You may answer in English or Norwegian.

Question 1 (20 points)

Transaction costs in environmental economics frequently deal with relations between polluters and those exposed to pollution, also denoted victims. There are two basic types of transaction costs: fixed and variable transaction costs.

- Graphically illustrate the impacts of *fixed transaction costs* on the resulting equilibrium. Briefly explain possible deviations from the no-transaction cost equilibrium. **(5 points)**
- Assign the property rights to victims and graphically illustrate the impacts of *variable transaction costs* on the amount emitted. Briefly explain the deviations from the no-transaction cost emission level. **(5 points)**
- Which of the two types of transaction costs are likely to be most challenging for the design of environmental policy? Briefly explain your answer, and state the assumptions you make. **(10 points)**

Question 2 (20 points)

Habitat conservation and management are important for protecting biodiversity. Consider an environmental procurement auction for habitat management contracts where potential providers can bid on both high and low performance contracts at the same time.

- Assuming truthful revelation of bids, give an economic interpretation of the difference in bid sizes between the high and low performance contracts. **(10 points)**
- Explain what problems (if any) that may arise when repeated auctions are held for habitat management contracts in an area. **(10 points)**

Question 3 (20 points)

Trade and environmental issues are of increasing importance and relevance as trade volumes grow. International trade are of particular interest as trading partners may face different environmental laws and regulations.

- Assume that some production activity mainly generates domestic negative externalities, i.e., reduces the welfare of the inhabitants in the country where the production occurs. Compare the welfare effects onto the inhabitants in the producing country when this product is mainly exported or mainly consumed domestically. What, if any, are the policy implications in the producing country of your findings? **(10 points)**
- Assume that the importing country has more strict environmental regulations than the exporting country for goods that are traded between these two countries. Under what con-

ditions should the importing country implement an import tax onto these goods? Explain your answer. **(10 points)**

Question 4 (40 points)

Clean waters and suitable sea temperatures for raising salmon are among the foremost nature based reasons for the large salmon aquaculture industry in Norway. Some aquaculture production facilities are located in fjords to lower the risk of damages on installations due to extreme high winds along the coast and to lower aquaculture firms' operating costs.

Suppose that in one of these fjords there is a proposal to allow for deposits of waste (emissions) from a nearby mining operation. The owners of the mining operation have produced solid documentation that their profits will decline the less mining waste they are allowed to emit, and without the permission to emit to the fjord, mining is no longer profitable.

The government proposes to allow for depositing mining waste in the fjord. In a response to the government's proposal, the owners of the aquaculture operations have also produced strong documentation that with increased mining deposits aquaculture profits will gradually decline, and at high levels of emissions from the mining activity, aquaculture operations in the fjord will eventually become unprofitable.

- (a) Find the optimal waste deposit level (emissions) from mining under the assumption that the only externality is from the mining industry onto the aquaculture sector. Briefly explain the reasoning behind your solution. Illustrating your solution graphically may be helpful. **(15 points)**
- (b) Explain how to set an optimal mining waste (emission) tax. **(5 points)**
- (c) The aquaculture operators and environmental groups initially agree to oppose any mining waste deposits. This agreement on a zero emissions from the mining activity may be short-lived as aquaculture operators see possibilities in a policy allowing for some emissions. What could these possibilities be? Please explain your reasoning. **(10 points)**
- (d) Some economists would argue that the involved parties should sort out this problem without government intervention. Which conditions must be in place for this to take place, and what kind of (private) solutions could one foresee? **(10 points)**

Eric Nævdal (sign.)
(external controller)

Eirik Romstad
(course responsible)