ECN 371 - Environmental Economics
09:00-12:00 - May 22, 2013

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)

Dynamics are increasingly important in environmental policy, but they also pose some new challenges for policy.

(a) State the conditions for dynamic (inter temporal) cost effectiveness, and give an example of dynamic cost effectiveness where you emphasize the dynamic aspects. **(5 points)**

(b) Show graphically why full achievement of static efficiency (optimality) and inter temporal efficiency may not always be jointly achievable. **(10 points)**

(c) Suppose full achievement of static and inter temporal efficiency are not jointly achievable. How would you seek to reconcile these two objectives? **(5 points)**

Question 2 (20 points)

(a) What is meant by the term *Pareto irrelevancy*, and what are its implications for environmental policy? **(5 points)**

(b) Show how rights under the assumption of variable transaction costs may influence what is efficient (optimal). **(5 points)**

(c) Fixed transaction costs are often used to justify government intervention, like the introduction of emission taxes or tradable emission permits. Show how this pertains to tradable emission permits in general, and explain how the fixed transaction cost issue can be resolved for agents who ordinarily do not participate in the market for emission permit trading. **(10 points)**

Question 3 (20 points)

The basic expression of the Folk theorem is: $1 > \beta \geq \dfrac{\phi - \pi_{c|c}}{\pi_{c|c} - \pi_{n|n}}$

(a) Starting from the basic condition for cooperative outcomes emerging in non-cooperative games, derive (show how to arrive at) the above expression for the Folk theorem.
(10 points)

(b) Explain **all the terms** in the above equation, and use the expression to graphically illustrate how changes in the payoffs influence the likelihood of getting cooperative outcomes. **(10 points)**

Question 4 (40 points)

Environmental issues are becoming increasingly important in international trade. A particularly troublesome issue in this regard is that some countries damage the environment to "subsidize" their export industries.

You are called in as an expert **to advice a small country** with strict environmental rules and regulations how they should react to such "subsidies". Keep in mind that the country you are advising is what is termed a "small open economy", i.e., a country with extensive international trade.

(a) The World Trade Organization (WTO) opens for import tariffs on goods that clearly face too lenient environmental regulations in the exporting country. What could be the beneficial impacts of such tariffs? In your answer also point to possible impacts in the export country of such tariffs. **(10 points)**

(b) What kind of difficulties, if any, do you see with using import tariffs as an environmental policy tool? **(10 points)**

(c) Explain why you make a distinction between global damages caused by the exporting country and damages on the exporting country's own (national) environment from such "subsidies". **(10 points)**

(d) A multilateral environmental agreement is an alternative to trade policies for inducing countries to place greater emphasis on environmental issues. What do you see as the major obstacles in getting multilateral environmental agreements in place, and how do these obstacles influence the advice you give to the "small open economy" government? **(10 points)**

Eric Nævdal (sign.)   Eirik Romstad
(external controller)   (course responsible)