

Exam in ECON9912 "Dynamic Games in Environmental Economics"

Posted 8:00am, Oslo local time, January 23rd, 2018.

Deadline: 8:00am, Oslo local time, January 24th, 2018.

Please email your exams directly to bard.harstad@econ.uio.no

Problems: There are eight subquestions, each having equal weight. Possible grades are pass and fail.

Unclear? I am not going to respond to questions of any sort on the exam. If things are unclear (which they will be, of course), then please clearly state the assumptions you are making and proceed from that.

1. Consider the model of "compliance technology" in Sections 2 and 3, Lecture note 1:

<http://www.sv.uio.no/econ/personer/vit/bardh/dokumenter/uphd1.pdf>

In this model, there is a single stock of technology and that technology can be of various types, for example "brown" and "clean".

- (i) How would you modify the model to allow for *both* "clean" and "brown" technology *at the same time*?
- (ii) How do you conjecture the results to change with this alternative model?

2. The possibility of "renegotiation" is discussed in both Lecture note 1 (Section 4.4) and in Lecture note 2 (Section 3.5):

<http://www.sv.uio.no/econ/personer/vit/bardh/dokumenter/uphd2.pdf>

- (i) What is the cost/benefit of the possibility of renegotiation in the two cases?
- (ii) If your answer differs between the two cases, *why* does the answer differ?

3. Consider the model of coalition formation in Lecture note 3:

<http://www.sv.uio.no/econ/personer/vit/bardh/dokumenter/uphd3.pdf>

Consider the same model as in this lecture note, and assume that technology investments are non-contractible. However, in contrast to that lecture note, assume that the duration of the contract, T , is exogenously given.

- (i) Derive the equilibrium coalition size.
- (ii) Discuss how and why your answer in (i) differs from the coalition sizes discussed in Lecture Note 3.

4. Throughout the class, we have applied different equilibrium concepts, such as (a) Nash equilibrium, (b) Subgame-perfect equilibrium, and (c) Markov-perfect equilibrium.

- (i) Please discuss which solution concept you think is most appropriate for international environmental problems.
- (ii) How do the predictions of the models depend on the choice of equilibrium concept?

