Undergraduate Program in Central European Studies

CERGE-EI and the School of Humanities at Charles University
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Environmental Policy in the Central European Context

Time: Thursdays 3 p.m. – 6 p.m.
Location: at CERGE-EI, Room # 7

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OUTLINE OF THE COURSE:
The aim of this course is to introduce students to some basic economic principles and theories explaining environmental issues and problems today and to explore existing policies at the national, international, and world level. Students will learn about the concepts such as externalities, the tragedy of the commons, enforcement as a public good, interventionalist solutions to the externality problem such as taxes and marketable pollution permits, as well as non-interventionalist solutions to the externality problem such as the Coasian solution and self-regulation. Students will also review the debate over the environmental Kuznets curve. Because experimental evidence complements theoretic insights, field data and simulating models nicely, we will do a couple of in-class experiments and also review some research articles that draw on the experimental methodology.

GRADING POLICY:
Mid-term written exam (40%), homeworks (20%) and final written exam (40%).

WEEK: TOPICS: DATE: INSTRUCTOR
1 Introduction (history/outline) Feb 19 JK/AO
2 Market failures: externalities, tragedy of the commons, enforcement as public good, also, (rise and fall) of the environmental Kuznets Curve February 26 AO
3 Interventionalist solutions to the Externality problem – Pigouvian taxes and standards and charges, also environmental labeling and incomplete consumer information in laboratory markets March 5 JK
4 Interventionalist solutions to the Externality problem – Marketable pollution permits March 12 AO

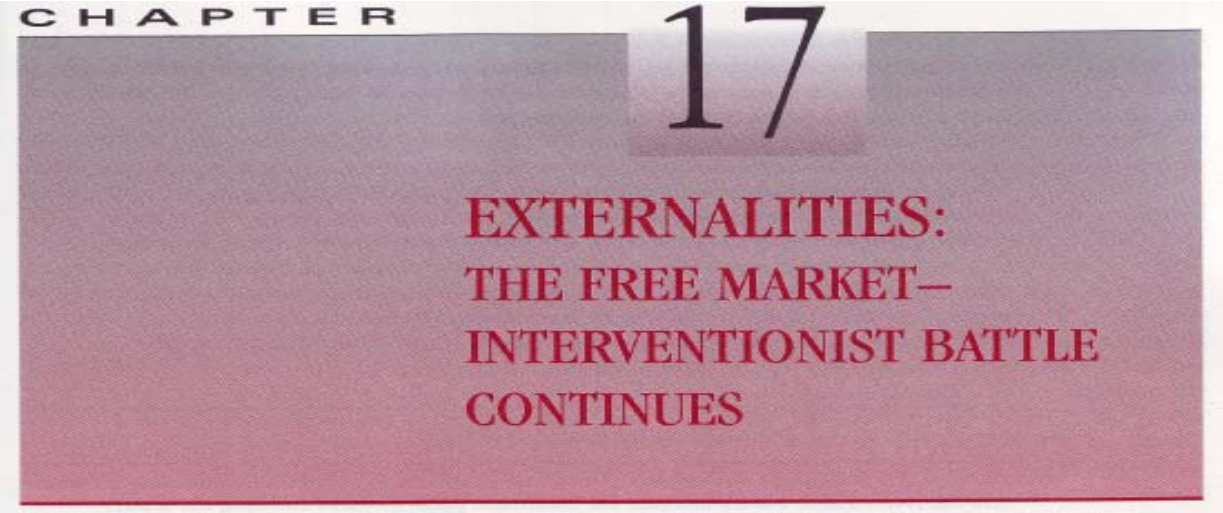
5 Non-Interventionalist solutions to the Externality problem – The Coasian solution March 19 JK
6 Non-interventionalist solutions to the Externality problem – Self-regulation March 26 AO
7 *Mid-term exam April 2*
8 Environmental Policy in the Czech Republic – History and current issues April 9 JK
9 Environmental Policy in the EU – History and current problems April 23 (April 16 falls into Semester break and on Easter Holiday) AO
10 Environmental Policy in the world context – History and Current problems April 30 JK/AO
11 Contingent valuation and related issues May 7 AO
12 To be determined by the interests of the class

Final exam: to be determined (according to schedule May 18 – 21)

REQUIRED READINGS (this list will be revised as we go):

See website: http://home.cerge-ei.cz/ortmann/UpcesCourse/Upcescourse.html

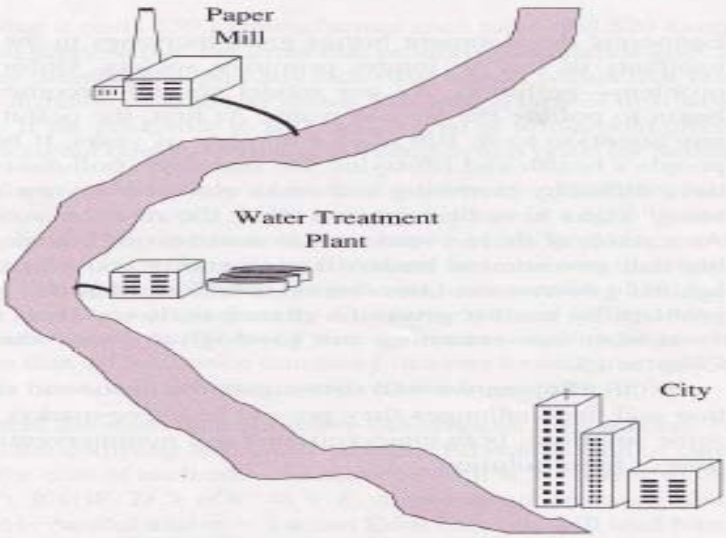
Textbook excerpt (Schotter, Microeconomics. A Modern Approach (Second Edition))



[Students: Where are you from? What is your academic background?]

FIGURE 17.1 Dolan's water-paper society.

The paper mill imposes an external cost on the water treatment plant by dumping its wastes into the river. These wastes increase the treatment plant's cost of cleaning the water.



[1]Edward Dolan, *TANSTAAFL: Economic Strategy for the Environmental Crisis* (New York: Holt, Rinehart & Winston, 1969), pp. 24–27. *TANSTAAFL* stands for "there ain't no such thing as a free lunch."

Paper mill produces

- paper at private cost
- waste at a cost to be borne by society (here represented by a water treatment plant that provides drinkable water to the city), i.e. a cost external to the paper mill

Water treatment plant produces

- clean water

Typical scenario for situations involving "common goods" such as water, air, other environs

An externality arises anytime when someone's economic (or other) activity imposes a cost on someone else.

In terms of the Dolan's water – paper society,

Given the externality created by the paper mill's wastes, can we expect our model society to produce Pareto-optimal amounts of clean water and paper? (Recall that a Pareto-optimal outcome requires that there be no other amounts of clean water and paper that, if produced, would make someone in the society better off without making anyone worse off.)

Intuitively, we might expect the answer to be no.

The paper mill is imposing an additional cost on the water treatment plant, but there is no mechanism to make the mill accountable for this cost, so it seems unlikely that the outcome for society will be Pareto-optimal. Indeed it is not …

Three conditions must be fulfilled for a perfectly competitive economy to be to produce Pareto-optimal outcomes:

- the marginal rate of substitution (the ratio of the MU (paper) to the MU (water), which in equilibrium has to be equal to the price ratio of the price of paper and the price of water) between of paper for water has to be the same for all consumers.
- the marginal rates of technical substitution of paper mill and water treatment plant ought to be the same (this is about production inputs and we can ignore it for now)
- the marginal rate of substitution of water for paper must be equal to the marginal rate of transformation of water for paper, which in equilibrium is supposed to be equal to the ratio of the marginal cost of producing paper to the marginal cost of producing clean water

But … the (private) marginal costs of paper and water are not what their (social) marginal costs, and the marginal utilities are … PROBLEM

There are essentially three “corrective policies “

- Pigou taxes
- Standards
- Tradable permits

Here they are (well, one of them), in Figures from Plott's article:

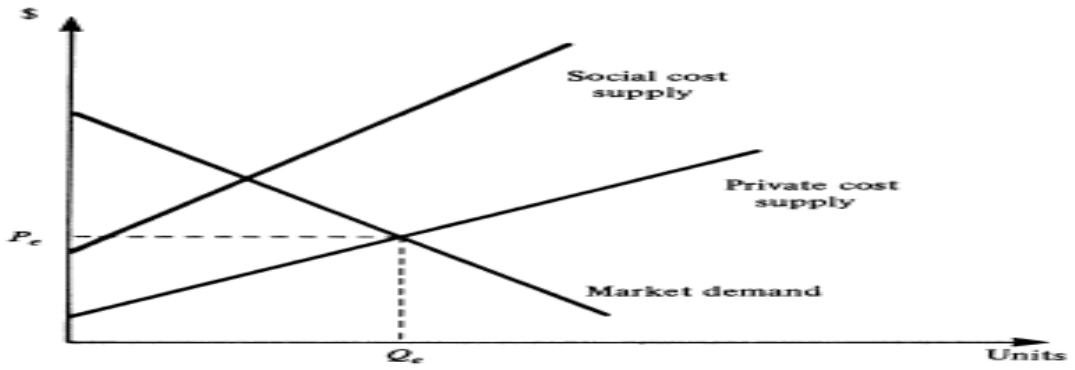


Fig. 1

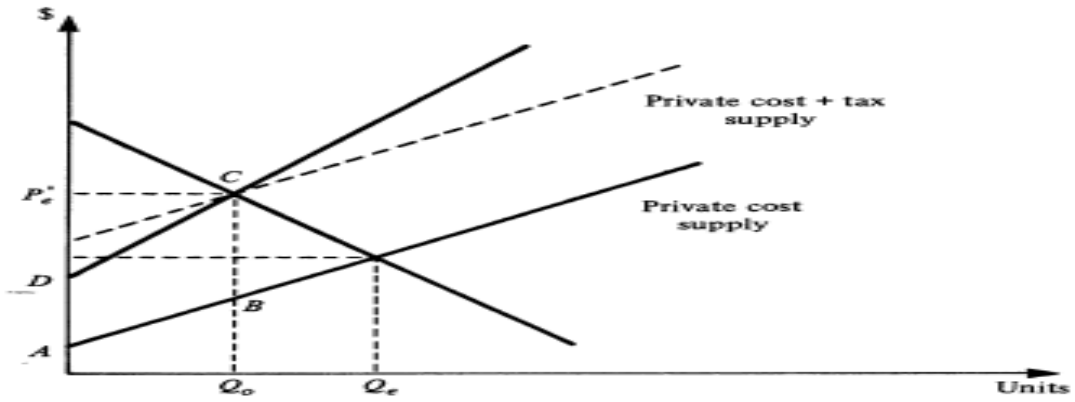


Fig. 2

Note the informational requirements – taxes may not be that practical !

The paper river: A demonstration of externalities

- [Give out pencils with eraser to all students]
- “Clear your desks except for a pencil. Each person on the right side represents Firm A, and each person on the left side represents Firm B. No calculators of any kind and no scratch paper please.”
- [Give five pieces of paper and a record sheet to each Firm A student.]
- [Explain (have assistant explain) to Firm B students how to build a paper plane (that can fly)]
- “Here are 10 multiplication problems (production tasks) for Firm A students:

  1. 376x92=? 2. 987x11=? 3. 454x76=? 4. 345x98=?
  5. 444x89=? 6. 321x45=? 7. 789x65=? 8. 465x87=?
  9. 842x35=? 10. 876x54=?

  You will get one bonus point for each problem solved correctly. The Firm A student with the most correct answers will earn [REWARD]. You may only use the pieces of papers that were distributed and the pencil. This round of production is over when the first Firm A student has finished all problems.”

- [Check solutions for multiplication problems (production tasks)]
- [Have Firm A students record their performance on the record sheet. Then have them give their five pieces of paper and record sheet to a Firm B student."

- “You will receive two bonus points for each paper airplane you can produce in two minutes using the paper that was just given to you from Firm A. If you wish to use your own airplane design, you will get paid as long as it is the required size, can fly, and has not writing on it. You are allowed to completely erase pencil marks, but you are not allowed to tear off portions of the paper to remove pencil marks. ”
- [Announce end of production period.]

- [Check which airplanes are acceptable.]
- “Record your earnings based on the number of acceptable airplanes that you have produced.”
- “How much of a cost was imposed on you in terms of the number of bonus points you were prevented from earning?”
  [Discuss externality problems in the present context.]
  - two firm located along a river in which one firm (A) pollutes the water used by another firm (B) downstream
  - river water is represented by small sheets of papers that are given to firm A students (upstream firm) who use them to generate answers to math problems
  - used paper is then passed on to firm B students (downstream firm) who must clean up the “pollution” before using the paper to produce paper airplanes

    - *What could be changed in order to make Firm A take into account no only its costs but also the costs it is imposing on Firm B?*
    - *How much did Firm A have to pay to use the paper?*
    - *How does the lack of a private cost to Firm A for using the paper influence its decision regarding paper utilization?*
    - *How could society insure that a firm takes into account not only its private costs. But also the social costs of production?*
    - *Should Firm A pay? Should Firm B pay? How should it pay? Who should it pay?*

Optional readings:

Cherry, Kroll, Shogren, Environmental Economics, Experimental Methods

Introduction

- Environmental economists quickly adopted the methods of the newly emerging area of experimental economics in the 1970s and 1980s (out of pragmatism?): in fact, “some of the earliest work in experimental economics was done by environmental economists.” (Kling; see also Plott article assigned as required reading for lectures 1 – 3 and articles by Hoffman & Spitzer and Harrison & McKee lecture 5)
- “Today, we have come full circle, and the experimental method is commonly applied to environmental economic questions, as evidenced by the research in this book and in the general economics literature.” (p.1)
- “A reader might be asking him- or herself whether such small scale experiments are the appropriate tool to test large-scale environmental policy. … Do the attempts to use the experimental method to understand better the micromotives that underpin the theory of environmental economics have anything to say about the efficiency and fairness of global environmental policy? Yes, it does, would be our answer. … By supplying information on the behavioral link between incentives, values, and choice, experiments might affect how policy is formed and evaluated. … Experimental evidence complements theoretical insight, field data, and simulation models to improve our understanding of the underlying assumptions and incentives that drive behavioral responses to policy.” (pp. 1 - 2)
- Experiments – “a useful tool to stress-test theory, look for empirical patterns of behavior, and testbed new institutions designed to protect nature. … laboratory experiments are used as a testbed for institutional design, markets, and mechanisms designed to improve resource allocation. For example, Cason & Plott (1996) examined in a laboratory experiment the incentives for sellers in new emission trading mechanisms proposed by the US Environmental Protection Agency.” (p. 2)
- 63 researchers … their latest work … exploring the behavioral underpinnings of environmental economics … some are environmental economists … some are experimental economists … 24 chapters, divided in our topical parts that cover the range of ongoing research today – tradable permit markets, common property and public goods, regulation and compliance, and valuation and preferences -- … each part with a discussion chapter written by an environmental eccnomist
- “The one common thread through all four discussion chapters is the call for more *context*. Experimental economists traditionally use ‘context-free’ settings and instructions in their experiments to make the experiment as general and applicable as possible, and ‘it is an accepted practice in economics experiments to strip away a lot of social context that is not an essential part of the theories being tested.’ (Holt 2006, p. 13)” (p. 3)

- “What other themes do the non-experimentalists address? … In his witty essay on the contributions in Part IV, “Valuation and Preferences,” John C. Whitehead … states that despite their flaws due to the lack of context, economic experiments have done a reasonable job in getting contingent valuation economists ‘out of their orbit around a far off hypothetical planet.’ He sees laboratory experiments and stated preference surveys as complementary approaches, where one’s strength can help to cover the other one’s weaknesses.” (p. 4)
- “ … the perpetual scientific tension between *control* and *context*. At the core, the experimental method is about *control*. One controls the experimental circumstances to avoid confounding; i.e. two or more elements change, which confounds our understanding of cause-and-effect. Without control, it is unclear whether unpredicted behavior is due to a poor theory or experimental design, or both. In contrast, others argue *context* is desirable to avoid a setting that is too sterile and too removed from reality … . All experiments face this challenge. Therein lies the beauty of the experimental method as applied to human beings rather than terrestrial plants or subatomic partials – one can use one’s imagination to experiment with alternative degrees of control versus context.” (pp. 4 – 5)

Horowitz, McConnell, Murphy, Behavioral Foundations of Environmental Economics and Valuation

- economists working on empirical approaches to measuring the value of non-market goods and services often cannot rely on revealed preferences (e.g., one could not have conducted a revealed preference study of the value of reducing pollution in Lake Erie in the 1970;s because the lake was so polluted that there was little use, and no alternative, comparable, cleaner lake to observe. In this case, there is no revealed preference data on which to base valuation, and hence no ability to estimate the value of pollution reduction." (p.1)
- "The failure of revealed preference methods for valuation tasks was the first impetus for developing state preference methods. The emergence of the notion of non-use values provided a second and perhaps more compelling motive for developing stated preference approaches. … for example the existence of a fragile ecosystem is part of the real income of many individuals but does not contribute to the area under the demand curve for the resource. This came to be called existence value later. Pure public goods [common goods?] with substantial existence values such as visibility, regional air quality or pristine environments could not be valued with revealed preference approaches but were important for environmental policy. There is no better example than the damages from the Exxon Valdez oil spill." (p. 2)
- "Stated preference studies now make up a large proportion of valuation research. This is not simply for the original reasons – the inability to observe some actions an the need to measure existence values – but the growing recognition that econometric problems compromise many preference studies. … [here] we are concerned with two problems that have arisen as economists have applied stated preference approaches to valuation. In particular, we review two issues – differences between values derived from real and hypothetical surveys and the gap between willingness to pay and willingness to accept – that are crucial to the acceptance and advancement of stated preference techniques. [see lecture 11] The NOAA Blue Ribbon Panel identified both of these issues as problems for the use of contingent valuation in damage assessment." (pp. 2 – 3)