

BISS

Experimental and Behavioral Approaches to Environmental Economics

August 19-23, 2024

Lecturer: Prof. Stephan Kroll, Colorado State University (stephan.kroll@colostate.edu)

Prof. Kroll is an environmental and experimental economist. Originally from the Ruhrgebiet (Essen!), he did his undergraduate work at the Universität Dortmund and received his Ph.D. from the University of Wyoming. Before starting at Colorado State University, he worked at universities in New York and California. He had had also lengthy research and teaching stints in Norway, Vietnam, Munich, Berlin and Innsbruck.

Course Website: On Moodle

Course Objectives

- By the end of the course students should be able to
- understand how market failures and their potential solutions are illustrated in lab experiments,
 - comprehend the virtues and limitations of experimental economics to study human behavior,
 - appreciate the role of experiments to test theoretical models of environmental economics, policies and institutions,
 - understand why international environmental agreements on global issues like climate change have not been very successful.

Course content

This course examines how environmental problems can be modelled as externality or public good problems, and how their (potential) solutions can be tested in (lab) experiments. We will talk about market failures, market solutions, and the incentives humans and societies face when making their decisions to degrade or to protect the environment.

We will survey how economic experiments have been used in the field of environmental economics to a) test the predictions of economic models, b) examine how humans respond to incentives, and c) test institutions and market designs. The main application is climate change and carbon mitigation policies, but we will also cover other environmental problems. We will discuss several concepts from behavioral economics and how they apply to the environmental field. Throughout the week we will play economic experiments (for small amounts of extra-credit points) to highlight the role of incentives and institutions.

Prerequisites

Both bachelor and master students can participate. Bachelor students must be at least in the second year of their bachelor studies and must have taken “Grundlagen der Mikroökonomik”.

Instructional methods

Lecture, plus economic in-class experiments.

Reading list

We will mostly cover academic journal articles that are posted on the Moodle website; a list of topics and a list of articles for the Entrance Test are below.

Time schedule

6 hours of teaching per day (an hour lasts 45 minutes):

Lecture from 08.30 to 10.00; break from 10.00 to 10.15, and another lecture 10.15-11.45.

Lunch break: 12.00-13.00.

Afternoon: Lecture from 13.00 to 14.30.

Assessment

40% paper (in groups of 2 master or 2 bachelor students; due Fri., Aug. 30, 17h, on Moodle)

30% two homework assignments (due Thurs., Aug. 22, and Tues., Aug. 27, 17h on Moodle)

30% daily “reading quizzes” (3-5 brief questions about assigned daily readings)

Writing Assignment

For the Writing Assignment, please summarize an academic environmental economics article that uses (lab) experiments in a style that would fit into the magazine *Resources* (<https://www.resourcesmag.org/>), which is published by the environmental think tank Resources for the Future, based in Washington D.C. (<https://www.rff.org/>).

Choose a technical article or, better yet, a series of articles and summarize it/them in a non-technical yet sophisticated way. The typical reader of a *Resources* article is an intelligent non-economist with strong interests in environmental and natural resource topics.

The original article(s) you choose can be from academic peer-reviewed journals such as

- Journal of Environmental Economics and Management (<http://www.sciencedirect.com/science/journal/00950696>)
- Environmental and Resource Economics (<http://link.springer.com/journal/volumesAndIssues/10640>)
- Journal of the Association of Environmental and Resource Economists (<http://www.journals.uchicago.edu/toc/jaere/current>)
- Ecological Economics (<http://www.sciencedirect.com/science/journal/09218009>)
- Journal of Behavioral and Experimental Economics (<https://www.sciencedirect.com/journal/journal-of-behavioral-and-experimental-economics>)
- Experimental Economics (<https://link.springer.com/journal/10683>)
- Journal of the Economic Science Association (<https://link.springer.com/journal/40881>)
- Journal of Economic Behavior and Organization (<https://www.sciencedirect.com/journal/journal-of-economic-behavior-and-organization>)

or other related journals.

The original article(s) should be

- recent (published in the last five years),
- technical (using a lab experiment),
- about an environmental or resource economics topic
- original research (not an overview or survey article in itself),
- related to topics we cover in the class, but not an article from the reading assignments in class, and
- policy relevant.

Your summary should be non-technical (for example, very few equations, if any; equations that are used and their variables should be explained carefully) and not use too much economics lingo, yet not written on a 5th-grade level either. The length should be around 1400 words (plus minus 300). You are encouraged to use graphs, which would not be counted toward the word limit. Examples of how original academic articles and their non-technical *Resources* summaries will be posted on Moodle. Two groups cannot choose the same articles.

Master students are expected to a) choose more technical academic articles, and b) indicate in a few sentences how the original experimental design could be improved/extended in a meaningful way.

TOPICS

- **What are Economic Lab Experiments?**
- **Experimental Methods for Environmental Economics**
- **Market Experiments**
- **Basic Supply-Demand Model of Externalities and Policies in Experiments**
- **Distributional Effects of Environmental Policies**
- **Public Support and Acceptability of Environmental Policies in Experiments and Surveys**
- **The Public-Good Model of Environmental Problems and Public-Good Experiments**
- **Valuation of Environmental Improvement: WTP vs WTA**
- **Policies in Experiments: Taxation versus Tradable Permits versus...**
- **International Environmental Agreements as Public Goods**
- **International Institution Formation in Experiments**
- **Testing of Market Designs in Experiments**
- **Carbon Pricing**
- **Informational Issues surrounding Environmental Goods**
- **Economics of Geoengineering: The Moral Hazard Controversy in Experiments and Surveys**

PAPERS FOR THE ENTRANCE EXAM:

Below are the papers you have to read in order to pass the Entrance Exam (all but one paper are eight pages and less).

Additional papers will be posted on Moodle several weeks before the start of the Summer School so that you are able to read them before the course starts.

Oates, Wallace (2006). An Economic Perspective on Environmental and Resource Management: An Introduction. In: Oates WE (Ed). The RFF reader in environmental and resource policy. Washington, DC: Resources for the Future, xv-xx.

Falk, Armin and James J. Heckman (2009). Lab Experiments are a Major Source of Knowledge in the Social Sciences. *Science* 326(5952): 535-538.

Fischbacher, Urs, Simon Gächter and Ernst Fehr (2001). Are People Conditionally Cooperative? Evidence from a Public Goods Experiment. *Economics Letters* 71, 397-404.

Cherry, Todd L., Steffen Kallbekken, Stephan Kroll and David M. McEvoy (2013). Cooperation In and Out of Markets: An Experimental Comparison of Public Good Games and Markets with Externalities. *Economics Letters* 120(1), 93-96.

Shogren, Jason F., Seung Y. Shin, Dermot J. Hayes, and James B. Kliebenstein (1994). Resolving Differences in Willingness to Pay and Willingness to Accept. *American Economic Review* 84/1, 255-270.

Klenert, David, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty and Nicolas Stern (2018). Making Carbon Pricing Work for Citizens. *Nature Climate Change* 8, 669-677.