

Empirical Methods in Energy and Environmental Economics

Doctoral Lecture/Seminar

Department of Management, Technology and Economics (ETH Zürich)

Course Outline:

Course Number: 364-0513-00 SD
Number of Credit Points: 3
Number of hours per week: Block seminar
Total hours: 29
Periodicity: Yearly course
Language of Instruction: English
Semester: Spring Semester 2015
Location: ZUE G 1, Zürichbergstrasse 18

Dates:

Wed., 13 January, 2016: 14:00 - 17:00
Thu., 14 January, 2016: 09:00 12.30 and 14:00 - 17:00
Fri., 15 January, 2016: 09:00 12.30 and 14:00 - 17:00
Thu., 21 January, 2016: 09:00 12.30 and 14:00 - 17:00
Fri., 22 January, 2016: 09:00 12.30 and 14:00 - 17:00

Instructors:

Prof. William Greene
(New York University)

Dr. Adán L. Martínez-Cruz
(ETH Zürich)

Contact:

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Course Description:

This course is designed for PhD students interested in Energy and Environmental Economics. This course is open to advanced Master students from D-MTEC and D-MATH (ETH Zürich).

The focus of the lectures is on applied econometrics in the energy and environmental fields. The goal is to present a coherent description of discrete choice modelling (e.g. conditional logit model) and its generalization in the form of count modelling (e.g. Poisson and negative binomial models) and survival analysis (e.g. proportional hazard Weibull model).

The contents and discussions aim put emphasis on real examples and policy applications. The presentations and discussions are based on a selection of recent research papers relevant to the covered topics. In each section of the seminar, the students will have the opportunity of reviewing and presenting some of the relevant papers to the class.

Prerequisite:

The students are expected to have attended a course in advanced microeconomics and econometrics.

Course Objectives:

The main objective that students learn about the application of econometric techniques and other empirical methods in scientific research in the fields of Energy and Environmental Economics. Through discussion and review of the existing literature, students will get a sense of how critical thinking can be used to assess empirical research in Energy and Environmental Economics. The course is organized as hours of lectures during which the

instructor will briefly present the theoretical framework as well as the methodologies used for empirical research in the covered topics. In the second part, empirical studies related to the topic will be presented and discussed by the students. In the final part, an empirical analysis will be performed by the student using an econometrics package provided by the instructor. Students will be required to bring for the lab sessions a laptop computer with the installed software (NLOGIT, STATA, or an equivalent package).

Grading:

The students are required to form groups of two to make one presentation of an already published paper and then write a review report (of 2-3 pages) of the selected paper. The evaluation will be based on the submitted report and the presentation. Students are expected to make a beamer presentation after the lectures each day. The duration of each presentation (and subsequent discussion) should be no longer than 30 minutes. The deadline for turning in the report is one week after the course has been completed (29 January).

Academic Dishonesty:

Please refer to the following websites with regard to ETH Zürich's policy towards academic dishonesty:

1. Disciplinary Code (<http://www.rechtssammlung.ethz.ch/?document=search&searchText=361.1>)
2. Research Integrity (<http://www.vpf.ethz.ch/services/researchethics/Broschure.pdf>)
3. Plagiarism (http://www.ethz.ch/faculty/exams/plagiarism/index_EN)

Registration steps:

1. Send an e-mail inquiring about the availability of seats to Dr. Adán L. Martínez-Cruz (madan@ethz.ch) by December 15th.
2. Register online if availability of seats is confirmed by Dr. Adán L. Martínez-Cruz

Online registration:

ETH students:

via mystudies, <https://www.lehrbetrieb.ethz.ch/myStudies/loginPre.do?lang=en>.

Students from other Swiss universities:

Register as special student (free of charge). Registration opens January, 1st 2016. Details at <https://www.ethz.ch/en/studies/non-degree-courses/special-students.html>

Students from non-Swiss universities:

Register as auditor (fees are CHF 100). Registration opens January, 1st 2016. Details at <https://www.ethz.ch/en/studies/non-degree-courses/auditors/auditors-non-ETH-members.html>

Part I: Discrete Choice Models; Professor Greene (16 hours)

1. Binary choice
2. Ordered choice
3. Multinomial choice
4. Multinomial choice and heterogeneity
5. Latent class models
6. Mixed logit

Part II: Count and survival modelling; Dr. Martínez-Cruz (13 hours)

1. Count modelling
 - (a) Poisson model
 - (b) Negative binomial model
2. Survival modelling
 - (a) Parametric survival models (e.g. Weibull)
 - (b) Semi-parametric survival models (e.g. Box-Cox)
3. Latent class specifications

References

- [1] A Colin Cameron and Pravin K Trivedi. Econometric models based on count data. comparisons and applications of some estimators and tests. *Journal of applied econometrics*, 1(1):29–53, 1986.
- [2] Michael W. Hanemann. Welfare evaluations in contingent valuation experiments with discrete responses. *American Journal of Agricultural Economics*, pages 332–341, 1984.
- [3] Daniel Hellerstein and Robert Mendelsohn. A theoretical foundation for count data models. *American journal of agricultural economics*, 75(3):604–611, 1993.
- [4] Daniel M Hellerstein. Using count data models in travel cost analysis with aggregate data. *American journal of agricultural economics*, 73(3):860–866, 1991.
- [5] David A. Hensher and William H. Greene. The Mixed Logit model: The state of practice. *Transportation*, 30:133–176, 2003.
- [6] David A. Hensher, John M. Rose, and William H. Greene. *Applied choice analysis: a primer*. Cambridge Univ Pr, 2005.
- [7] Stephen P Jenkins. Survival analysis. *Unpublished manuscript, Institute for Social and Economic Research, University of Essex, Colchester, UK*, 2005.
- [8] Daniel McFadden. Economic choices. *American Economic Review*, pages 351–378, 2001.
- [9] Daniel McFadden and Kenneth Train. Mixed MNL models for discrete response. *Journal of Applied Econometrics*, 15(5):447–470, 2000.
- [10] John Mullahy. Instrumental-variable estimation of count data models: Applications to models of cigarette smoking behavior. *Review of Economics and Statistics*, 79(4):586–593, 1997.
- [11] Kenneth Train. *Discrete choice methods with simulation*. Cambridge Univ Pr, 2003.

Parts I Student Presentations

- [12] Jonn Axsen, Joseph Bailey, and Marisol Andrea Castro. Preference and lifestyle heterogeneity among potential plug-in electric vehicle buyers. *Energy Economics*, 50:190–201, 2015.
- [13] Hisanori Goto, Mika Goto, and Toshiyuki Sueyoshi. Consumer choice on ecologically efficient water heaters: Marketing strategy and policy implications in japan. *Energy economics*, 33(2):195–208, 2011.
- [14] Carl Christian Michelsen and Reinhard Madlener. Homeowners’ preferences for adopting innovative residential heating system: A discrete choice analysis for germany. *Energy Economics*, 34:1271–1283, 2012.
- [15] Kayo Murakami, Takanori Ida, Makoto Tanaka, and Lee Friedman. Consumers willingness to pay for renewable and nuclear energy: A comparative analysis between the us and japan. *Energy economics*, 50:178–189, 2015.
- [16] Riccardo Scarpa and Ken Willis. Willingness-to-pay for renewable energy: Primary and discretionary choice of British households’ for micro-generation technologies. *Energy Economics*, 32(1):129–136, 2010.
- [17] Nada Wasi and Richard T. Carson. The influence of rebate programs on the demand for water heaters: The case of New South Wales. *Energy Economics*, 40:645–656, 2013.

Part II Student Presentations

- [18] Kenneth A Baerenklau. A latent class approach to modeling endogenous spatial sorting in zonal recreation demand models. *Land Economics*, 86(4):800–816, 2010.
- [19] Allen Blackman, Bidisha Lahiri, William Pizer, Marisol Rivera-Planter, and Carlos Muñoz-Piña. Voluntary environmental regulation in developing countries: Mexicos clean industry program. *Journal of Environmental Economics and Management*, 60(3):182–192, 2010.
- [20] Brooks Depro and Raymond B Palmquist. How do ozone levels influence the timing of residential moves? *Land Economics*, 88(1):43–57, 2012.
- [21] Timothy C Haab. Temporal correlation in recreation demand models with limited data. *Journal of Environmental Economics and Management*, 45(2):195–212, 2003.
- [22] Timothy C Haab and Kenneth E McConnell. Count data models and the problem of zeros in recreation demand analysis. *American Journal of Agricultural Economics*, 78(1):89–102, 1996.
- [23] Stephen Hynes and William Greene. A panel travel cost model accounting for endogenous stratification and truncation: A latent class approach. *Land Economics*, 89(1):177–192, 2013.