ECO 567A: Energy Economics with Geography Focus

Academic Year: 2021-2022

Professor Geoffrey Barrows

geoffrey-masters.barrows@polytechnique.edu

Syllabus

Description:

This course examines the supply and demand of environmental goods in heterogeneous regions. The course first introduces externalities into the neoclassical model and then studies different policy options for correcting market failures stemming from these externalities. Drawing on recent empirical evidence, the course then examines how agents sort across space when environmental quality differs between regions. We pay particular attention to the supply and demand of energy, which directly impacts both local and global pollution. Finally, the course considers how trade between regions impacts pollution, and the heterogeneous impacts of global climate change on welfare.

Location:

Lectures take place on Friday mornings 9am – 11am. In Amphi Painleve

Exam Wednesday March 16 9am

Course website:

Lecture slides and references will be posted to the secured polytechnique catalogue site for the course.

Grading:

Normally, evaluations are based on a group research project and a final exam. But given the heath situation, we are not going to have a final exam. We will just have individual research projects.

Research Project:

Students are assigned to complete a short research project by the end of the course. The purpose of the research project is to learn about a specific question of interest and to apply the empirical methods from the course. Each student will submit a report at the end of the term of roughly 10-15 pages.

The report should include (1) a question of interest in the field of sustainable development (2) a brief literature review about what has been done on the question to date (3) an empirical strategy for addressing the question with real data (4) a description of the data.

Students are not required to execute the empirical strategy. That is, students do not need to answer the question they pose. The point is to identify an interesting question and propose a strategy for how to answer it. Students may wish to execute the proposed strategy for a different class, or MA thesis, etc. But for the purposes of this course, students need only set up the strategy.

Students will have time during some TD hours to consult with me on their project.

Students are free to choose their own topics. However, a list of potential topics is also listed on the course website. Students are free to choose one of these topics. It is fine for multiple students to address the same question.

Schedule:

Session	Lecture	Date
1	Introduction to Environmental Economics	Jan 7
2*	Demand for Environmental Quality I – Estimation	Jan 14
3*	Demand for Environmental Quality II – Tiebout Sorting and Environmental Justice	Jan 21
4*	Amenities and Quantitative Spatial Economic Models	Jan 28
5	Energy Production	Feb 4
6	Energy Demand	Feb 11
7	Energy Efficiency Innovation	Feb 18
8*	Trade and Pollution	March 4
9*	Climate Change	Thursday, March 10 PC20

***** Indicates that MiE students taking 5-lecture subset should attend

Text Books:

Perloff, Jeffrey M. *Microeconomics: theory and applications with calculus*. Pearson Higher Ed, 2017.

Greene, William H. *Econometric analysis*. Pearson Education India, 2003.

Kolstad, C. D. "Environmental Economics. Oxford University Press: New York, Oxford." (2006).

Angrist, Joshua D., and Jörn-Steffen Pischke. *Mostly harmless econometrics: An empiricist's companion*. Princeton university press, 2008.

Schedule:

Part I: Demand for Local Environmental Quality

Lecture 1: Introduction to Environmental Economics

Introduction to OLS Regressions

Readings:

Rubinstein, Ariel. *Lecture notes in microeconomic theory: the economic agent*. Princeton University Press, 2012.

Greene, William H. *Econometric analysis*. Pearson Education India, 2003.

Lecture 2: Demand for Environmental Quality I – Estimation

Introduction to Research Design

Readings:

Davis, Lucas W. "The effect of health risk on housing values: Evidence from a cancer cluster." The American Economic Review 94.5 (2004): 1693-1704.

Jayachandran, Seema. "Air quality and early-life mortality evidence from Indonesian wildfires." Journal of Human resources 44.4 (2009): 916-954.

Currie, Janet, et al. "Environmental health risks and housing values: evidence from 1,600 toxic plant openings and closings." *The American economic review* 105.2 (2015): 678-709.

Angrist, Joshua D., and Jörn-Steffen Pischke. *Mostly harmless econometrics: An empiricist's companion*. Princeton university press, 2008.

Lecture 3: Demand for Environmental Quality II – Spatial Equilibrium and Environmental Justice

Readings:

Roback, Jennifer. "Wages, rents, and the quality of life." *Journal of political Economy* 90.6 (1982): 1257-1278.

Albouy, David. "What are cities worth? Land rents, local productivity, and the total value of amenities." *Review of Economics and Statistics* 98.3 (2016): 477-487.

Depro, Brooks, Christopher Timmins, and Maggie O'Neil. "White flight and coming to the nuisance: can residential mobility explain environmental injustice?." *Journal of the Association of Environmental and resource Economists* 2.3 (2015): 439-468.

Tiebout, Charles M. "A pure theory of local expenditures." *Journal of political economy* 64.5 (1956): 416-424.

Kolstad (Chapter 8)

Lecture 4: Local Amenities and Quantitative Spatial Economic Models

Diamond, Rebecca. "The Determinants and Welfare Implications of US Workers' Diverging Location Choices by Skill: 1980-2000." *American Economic Review* 106.3 (2016): 479-524.

Bartelme, Dominick. "Trade costs and economic geography: evidence from the us." *Work. Pap., Univ. Calif., Berkeley* (2015).

Part II: Supply of Local Environmental Quality – The Case of Energy

Lecture 5: Energy Production

Davis, Lucas W. "The effect of power plants on local housing values and rents." Review of Economics and Statistics 93.4 (2011): 1391-1402.

Clay, Karen, Joshua Lewis, and Edson Severnini. Canary in a Coal Mine: Infant Mortality, Property Values, and Tradeoffs Associated with Mid-20th Century Air Pollution. No. w22155. National Bureau of Economic Research, 2016.

Lipscomb, Molly, Mushfq A. Mobarak, and Tania Barham. "Development effects of electrification: Evidence from the topographic placement of hydropower plants in Brazil." American Economic Journal: Applied Economics 5.2 (2013): 200-231.

Muehlenbachs, Lucija, Elisheba Spiller, and Christopher Timmins. "The housing market impacts of shale gas development." *The American Economic Review* 105.12 (2015): 3633-3659.

Lecture 6: Energy Demand

Ito, Koichiro. "Do consumers respond to marginal or average price? Evidence from nonlinear electricity pricing." *The American Economic Review* 104.2 (2014): 537-563.

Sexton, Steven E., and Alison L. Sexton. "Conspicuous conservation: The Prius halo and willingness to pay for environmental bona fides." *Journal of Environmental Economics and Management* 67.3 (2014): 303-317.

Allcott, Hunt. "Social norms and energy conservation." *Journal of Public Economics* 95.9 (2011): 1082-1095.

Sexton, Steven. "Automatic bill payment and salience effects: Evidence from electricity consumption." *Review of Economics and Statistics* 97.2 (2015): 229-241.

Lecture 7: Energy Efficiency Innovation

Howell, Sabrina T. "Financing innovation: evidence from R&D grants." *The American Economic Review* 107.4 (2017): 1136-1164.

Aghion, Philippe, et al. "Carbon taxes, path dependency, and directed technical change: Evidence from the auto industry." *Journal of Political Economy* 124.1 (2016): 1-51.

Allcott, Hunt, and Michael Greenstone. "Is there an energy efficiency gap?" *Journal of Economic Perspectives* 26.1 (2012): 3-28.

Lecture 8: Trade and Pollution

Copeland, Brian R., and M. Scott Taylor. "North-South trade and the environment." *The quarterly journal of Economics* 109.3 (1994): 755-787.

Antweiler, Werner, Brian R. Copeland, and M. Scott Taylor. "Is free trade good for the environment?." *American Economic Review* 91.4 (2001): 877-908.

Shapiro, Joseph S., and Reed Walker. "Why is Pollution from US Manufacturing Declining? The Roles of Environmental Regulation, Productivity, and Trade." *American Economic Review*. (forthcoming)

Part III: Global Environmental Quality

Lecture 9: Climate Change

Mendelsohn, Robert, William D. Nordhaus, and Daigee Shaw. "The impact of global warming on agriculture: a Ricardian analysis." *The American economic review* (1994): 753-771.

Schlenker, Wolfram, W. Michael Hanemann, and Anthony C. Fisher. "Will US agriculture really benefit from global warming? Accounting for irrigation in the hedonic approach." *American Economic Review* 95.1 (2005): 395-406.

Deschenes, Olivier, and Michael Greenstone. "The economic impacts of climate change: evidence from agricultural output and random fluctuations in weather." *American Economic Review* 97.1 (2007): 354-385.

Costinot, Arnaud, Dave Donaldson, and Cory Smith. "Evolving comparative advantage and the impact of climate change in agricultural markets: Evidence from 1.7 million fields around the world." *Journal of Political Economy* 124.1 (2016): 205-248.