EMISSIONS TRADING IN THEORY AND PRACTICE

Block seminar in the BSc program in Economics
Course language: English
Prerequisites: Markets and the Environment (can be taken concurrently), or equivalent
Examination: Seminar Paper (80%), presentation (pass/fail), class room discussion (20%)
ECTS-Credits: 6

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Class dates:	Wednesday, 13:45 p.m. – 15:15 p.m., Room SO 115
	First day of class is February 20

Syllabus

Since environmental policies were first implemented in industrialized countries more than four decades ago, the initial "command-and-control" approach has given way to more decentralized, price-based policies to regulate pollution emissions. A Pigouvian tax is a well-established such policy, but governments around the world are increasingly favoring “emissions trading” schemes, i.e. establishing a market where polluters can buy and sell emission permits.

Drawing on theoretical, empirical and experimental research, this seminar analyzes a variety of economic, political and environmental aspects of this policy: Environmental effectiveness and economic costs, impacts on market structure and on international competitiveness, incentives for innovation in clean technologies, optimal design of permit allocation mechanisms and market stabilizing interventions, as well as behavioral aspects.

Students will write a 10-page paper on a particular aspect and present their work in class. The classroom participation is required but will not be graded. It is an opportunity for students to get feedback both on their presentation skills and on the material they will cover in their seminar paper. The seminar paper counts for 80% of the final grade, and class room participation for the remaining 20%.

Required Readings

Kolstad, C. Environmental Economics. Chapter 13, p. 272-280, Ch. 14, pp. 289-293

Baumol, W. and W. Oates. The Theory of Environmental Policy. 2nd ed. Chapter 12.

Ellerman, A.D., Marcantonini, C. and A. Zaklan (2016). The European Union Emissions Trading System: Ten Years and Counting. *Review of Environmental Economics and Policy,* 10 (1): 89-107.

Martin, R., M. Muûls and U.J. Wagner (2016). The Impact of the European Union Emissions Trading Scheme on Regulated Firms: What Is the Evidence after Ten Years? *Review of Environmental Economics and Policy,* 10 (1): 129-148.

Optional Reading

Perman, Roger, Yue Ma, Michael Common, David Maddison, James McGilvray: Natural Resource and Environmental Economics. Addison Wesley. 4th edition
Chapters 5 & 6.

Note: Some book chapters are available as pdf files on ILIAS

Topics

The following is a list of suggested topics, along with one or two citations that are meant to provide you with a starting point for your own literature search. If you want to work on a topic not listed here please speak to the instructor.

1. Innovation

Calel, R., and Dechezleprêtre, A. (2015). Environmental policy and directed technological change: Evidence from the European carbon market. *Review of Economics and Statistics* (forthcoming). DOI: 10.1162/REST_a_00470

Requate, Till, (2005), Dynamic incentives by environmental policy instruments--a survey, *Ecological Economics*, 54(2-3): 175-195.

2. Abatement

Fowlie, M., Holland, S. P., and Mansur, E. (2012). What do emissions markets deliver and to whom? Evidence from Southern California's NO_x trading program. *American Economic Review*, 102(2): 965-993.

3. Technology adoption

Fowlie, M. (2010). Emissions Trading, Electricity Restructuring, and Investment in Pollution Abatement. *American Economic Review*, 100(3): 837-869.

4. Interactions with co-pollutants

Novan, K. (2017). Overlapping Environmental Policies and the Impact on Pollution. *Journal of the Association of Environmental and Resource Economists*, 4(S1): S153-S199. https://doi.org/10.1086/691994

5. Economic Performance: Employment, Profits, Output

Petrick, S. and Wagner, U. J., (2014). The Impact of Carbon Trading on Industry: Evidence from German Manufacturing Firms. *Kiel Working Paper No. 1912*. http://dx.doi.org/10.2139/ssrn.2389800

Marin, G., Marino, M. & Pellegrin, C. (2017). The Impact of the European Emission Trading Scheme on Multiple Measures of Economic Performance. *Environmental and Resource Econonomics.* https://doi.org/10.1007/s10640-017-0173-0

Jaraite J, Di Maria C (2015). Did the EU ETS make a difference? An empirical assessment using Lithuanian firm-level data. *Energy Journal* 37(1):1–23.

6. Pass-Through and Windfall Profits

Fabra, N., and Reguant, M. (2014). Pass-through of emissions costs in electricity markets. *American Economic Review* 104(9): 2872-2899.

James B. Bushnell & Howard Chong & Erin T. Mansur, 2013. "Profiting from Regulation: Evidence from the European Carbon Market," *American Economic Journal: Economic Policy*, vol. 5(4): 78-106.

7. Carbon Leakage through Trade and Investment

Sato, M. and A. Dechezleprêtre (2017). Asymmetric industrial energy prices and international trade. *Energy Economics*, Volume 52, Supplement 1, S130-S141. https://doi.org/10.1016/j.eneco.2015.08.020

Ralf Martin & Mirabelle Muuls & Laure B. de Preux & Ulrich J. Wagner, 2014. "Industry Compensation under Relocation Risk: A Firm-Level Analysis of the EU Emissions Trading Scheme," *American Economic Review*, vol. 104(8): 2482-2508.

S. Borghesi, C. Franco and G. Marin (2018). Outward Foreign Direct Investments Patterns of Italian Firms in the EU ETS and Chiara Franco), forthcoming in *Scandinavian Journal of Economics.* WP version

8. Gains from Trade and Trading Behavior

Curtis Carlson & Dallas Burtraw & Maureen Cropper & Karen L. Palmer, 2000. "Sulfur Dioxide Control by Electric Utilities: What Are the Gains from Trade?" *Journal of Political Economy*, 108(6): 1292-1326.

9. Market power

Hahn, R.W. (1984). Market Power and Transferable Property Rights, *Quarterly Journal of Economics* 99: 753-765.

Montero, J.P. (2009). Market power in pollution permit markets. Energy Journal, Vol. 30 (2): 1-28.

10. Permit Allocation – Independence Hypothesis

Fowlie, M. and Perloff, J. (2013). Distributing Pollution Rights in Cap-and-Trade Programs: Are Outcomes Independent of Allocation? Review of Economics and Statistics, 95(5): 1640-1652.

11. Permit Allocation – Addressing competitiveness impacts

Fowlie, M., M. Reguant, and S.P. Ryan (2016). Market-Based Emissions Regulation and Industry Dynamics. *Journal of Political Economy* 124:1, 249-302.

Frédéric Branger, Jean Pierre Ponssard, Oliver Sartor, Misato Sato (2015). EU ETS, Free Allocations, and Activity Level Thresholds: The Devil Lies in the Details. *Journal of the Association of Environmental and Resource Economists*. Volume 2, No. 3, 401-437.

Meunier, Guy & Ponssard, Jean-Pierre & Quirion, Philippe, 2014. "Carbon leakage and capacity-based allocations: Is the EU right?," *Journal of Environmental Economics and Management*, Elsevier, vol. 68(2), pages 262-279.

12. Permit prices with heterogeneous damages

Fowlie, M. and Muller, N. (2018). "Market-based emissions regulation when damages vary across sources:What are the gains from differentiation?" *Journal of the Association of Environmental and Resource Economists,* forthcoming.

Muller, N. and Mendelsohn, R. (2007). "Measuring the damages of air pollution in the United States." *Journal of Environmental Economics and Management*, 54(1): 1-14.

Muller, N. and Mendelsohn, R. (2009). "Efficient Pollution Regulation: Getting the Prices Right." *American Economic Review*, 99(5):1714–1739.