

Doctoral Course

“Trade, Environment, and Growth: Advanced topics in Input-Output Analysis”*

Professor: Erik Dietzenbacher (U. Groningen)

March 9-13, 2015

Description

This course applies input-output analysis to issues on trade, on environment, and on growth. For the production of commodities and services, industries depend on other industries for their intermediate products. More and more, such linkages between industries cross borders. Input-output analysis is a tool that takes such interdependencies in the production structure into full account. It has been applied to a wide variety of topics, ranging from agricultural and development economics to disciplines dealing with energy and environmental issues. The course will focus on three of such topics. Typical questions are the following. How much high-skilled labor in the US is involved in satisfying the demand for cars by households in Australia, reflecting trade in production factors? What is the greenhouse gas footprint of China, or how large are the Chinese "exports" of greenhouse gas emissions? What percentage of the growth in German GDP between 1995 and 2009 was due to the increased household consumption in the rest of the EU? To analyze these questions, the World Input-Output Database will be used.

Place: **Room B0.3** (Faculty of Economics and Business, **Sarriko**, UPV/EHU, Bilbao)
Timetable: 10:00h – 13:00h.

If you are interested in attending the course, please send an email to marta.escapa@ehu.es or ainhoa.azkarate@bc3research.org (limited capacity).

*Jointly organized and financed by the Doctoral Program in Economics (Instruments of the Economic Analysis), the Basque Centre for Climate Change (BC3) and the Research group on Economics and the Environment (UPV/EHU, Gobierno Vasco, IT-799-13).

OUTLINE OF THE COURSE

This course (for which some basic knowledge of matrix algebra is indispensable) discusses recent developments in input-output analysis with applications to issues on trade, on environment, and on growth. For the production of commodities and services, industries depend on other industries for their intermediate products. More and more, such linkages between industries cross borders. Input-output analysis is a tool that takes such interdependencies in the production structure into full account. It has been applied to a wide variety of topics, ranging from agricultural and development economics to disciplines dealing with energy and environmental issues.

The course is centered around some of my own research topics. That is, I will discuss a set of papers (some of which have recently been published, are forthcoming, are in the process of completion, or are still work in progress). I will start the course by briefly “revisiting” the common toolbox in input-output economics. The lectures are given in five daily sessions, each taking 3 hours, and the schedule is as follows.

Session 1. Introduction to input-output analysis and Exercises (Monday, March 9, 10:00 – 13:00)

1. Dietzenbacher, E. (2012) A crash course in input-output economics, Working Paper, University of Groningen

Session 2. Global multi-regional tables: the World Input-Output Database (Tuesday, March 10, 10:00 – 13:00)

2. Tukker, A. and E. Dietzenbacher (2013) Global multiregional input-output frameworks: an introduction and outlook, *Economic Systems Research*, 25, 1-19.
3. Dietzenbacher, E., B. Los, R. Stehrer, M. Timmer and G. de Vries (2013) The construction of world input-output tables in the WIOD project, *Economic Systems Research*, 25, 71-98.
4. Dietzenbacher, E., J. Guilhoto and D. Imori (2014) The role of Brazilian regions in the global value chain. *Preliminary and partial draft*.

**Session 3. Trade and international fragmentation
(Wednesday, March 11, 10:00 – 13:00)**

5. Dietzenbacher, E., V. Albino and S. Kühtz (2014) The treatment of imports in input-output tables and its consequences. *Preliminary draft*.
6. Yang, C, E. Dietzenbacher, J. Pei, X. Chen, K. Zhu and Z. Tang (2014) Processing trade biases the measurement of vertical specialization in China, *Economic Systems Research*, forthcoming.
7. Dietzenbacher, E., J. Pei and C. Yang (2012) Trade, production fragmentation and China's carbon dioxide emissions, *Journal of Environmental Economics and Management*, 64, 88-101.

**Session 4. Trade and the environment
(Thursday, March 12, 10:00 – 13:00)**

8. Serrano, M. and E. Dietzenbacher (2010) Responsibility and trade emission balances: an evaluation of approaches, *Ecological Economics*, 69, 2224-2232.
9. Dietzenbacher, E. and B. Los (1998) Structural decomposition techniques: Sense and sensitivity, *Economic Systems Research*, 10, 307-323.
10. Dietzenbacher, E. and I. Arto (2014) Drivers of the growth in global greenhouse gas emissions, *Environmental Science & Technology*, 48, 5388-5394.
11. Dietzenbacher, E. and M. Serrano (2014) How much would the Kyoto protocol have cost consumers? *Preliminary draft*. (With M. Serrano)

**Session 5. A global supply chain perspective
(Friday, March 13, 10:00 – 13:00)**

12. Dietzenbacher, E. and I. Romero (2007) Production chains in an interregional framework: identification by means of average propagation lengths, *International Regional Science Review*, 30, 362-383.
13. Dietzenbacher, E., I. Romero Luna and N.S. Bosma (2005) Using average propagation lengths to identify production chains in the Andalusian economy, *Estudios de Economía Aplicada*, 23, 405-422.
14. Romero, I., E. Dietzenbacher and G.J.D Hewings (2009) Fragmentation and complexity: Analyzing structural change in the Chicago regional economy, *Revista de Economía Mundial*, 23, 263-282.
15. Los, B., E. Dietzenbacher, R. Stehrer, M. Timmer and G. de Vries (2012) Trade performance in internationally fragmented production networks: concepts and measures, [*WIOD Working Paper Nr. 11*](#).