

Empirical Dynamic Models in IO

Module 15506 – Selected Topics: Markets and Institutions

Lecturer Prof. Van Anh Vuong, Ph.D.

Location/Room	Weyertal 121, Kursraum 2 (Raum-Nr. 0.13)
Time	01.12. – 05.12.2014, daily 14:00-18:00h
Credit points	6
Type of course	Lectures
Course language	English

1. Objectives

Students learn to read empirical economics research papers critically, identify each paper's weaknesses and strength. The course introduces industrial economic problems in dynamic context and focuses on a subset of dynamic models. In particular, we discuss model setups, their estimation techniques and applications to specific industries.

2. Prerequisites

Microeconomics

Industrial organization

Applied econometrics

Prior knowledge on Matlab and Stata is not necessary

3. Relevance for study programs

The course is open to master and doctoral students.

4. Registration

Registration for master and doctoral students takes place in the course (Registration deadline: 05.12.2014). Master students who register for the seminar will be registered at the examination office and receive malus points for not handing in the report and proposal (see below).

5. Contents

The course discusses models and methods in industrial economics that are used to explain market structure, competition, entry and exit behavior of the firms and their implementation (details see syllabus below).

6. Seminar format

Lectures and student presentations

7. Working requirements and assessment method

Each student will complete a referee report on a paper assigned by me. Additionally, students are required to submit and present a research proposal based on the papers discussed in class.

Submission of a referee report on a paper assigned in class (due 17.02.2015; 30% of final grade).

Submission of a research proposal (due 17.02.2015; 50% of final grade).

Presentation of the research proposal (by appointment; 20% of final grade).

8. Teaching staff

Prof. Van Anh Vuong, Ph.D., Assistant professor for applied microeconomics at the University of Cologne and affiliated researcher at the Institute of Energy Economics at the University of Cologne

9. Co-ordination/Contact

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Syllabus¹

I/Introduction and Overview

Aguirregabiria, Victor and Pedro Mira, "Dynamic Discrete Choice Structural Models: A Survey", *Journal of Econometrics*, 2010, pp. 38 – 67.

Doraszelski, Ulrich and Ariel Pakes, "A Framework for Applied Dynamic Analysis in IO", *Handbook of Industrial Organization*, Vol 3, Chapter 30, 2007.

Bertsekas Dimitri, "Dynamic Programming and Optimal Control", Athena Scientific, Vol.1, 2, 2012.

Stokey Nancy, Robert Lucas and Edward Prescott, "Recursive Methods in Economic Dynamics", Harvard University Press, 1989.

II/ Single Agent Decisions

This section focuses on the model set up and estimation of dynamic discrete choice models in the single agent framework. These models allow for firms to act independently and do not consider strategic interaction across firms. Goal is to model and estimate agent's 0/1 decision which can be applied to a wide ranges of economic questions such as discrete investment decisions, entry and exit decisions. The agents are forward-looking and the decisions are made when future states (firm characteristics/market conditions) are uncertain.

Rust, John, "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher", *Econometrica*, September 1987, pp. 999 -1033.

Pakes, Ariel, "Patents as Option: Some Estimates of the Value of Holding European Patent Stocks", *Econometrica*, July 1986, pp. 755 – 784.

Hotz, Joseph and Robert A. Miller, "Conditional Choice Probabilities and the Estimation of Dynamic Models", *Review of Economic Studies*, July 1993, pp. 497 – 529.

Aw, Bee Yan, Mark J. Roberts and Daniel Yi Xu, "R&D Investment, Exports and Productivity Dynamics", *American Economic Review*, June 2011, pp. 1312 – 1344.

Peters, Bettina, Mark J. Roberts, Van Anh Vuong and Helmut Fryges, "Estimating Dynamic R&D Choice: An Analysis of Costs and Long-Run Benefits", NBER Working Paper 19374, August 2014.

III/ Dynamic Oligopoly

In this section we focus on dynamic oligopoly models explaining different industry dynamics. Each agent's payoff depends on its rivals' actions in a dynamic framework. The agents' decisions are estimated and the long-run market structure is treated as endogenous.

¹ The list of papers is intended for orientation and is not exhaustive.

Pakes, Ariel and Richard Ericson, "Markov Perfect Industry Dynamics: A Framework for Empirical Work", *Review of Economic Studies*, January 1995, pp. 53 - 82.

Bajari, Patrick, C. Lanier Benkard, Jonathan Levin, "Estimating Dynamic Models of Imperfect Competition", *Econometrica*, 2007, pp. 1331 - 1370.

Pakes, Ariel, Michael Ostrovsky, and Steve Berry, "Simple Estimators for Parameters of Discrete Dynamic Games (with Entry/Exit Examples)", *Rand Journal*, Summer 2007, pp. 373 - 399.

Ryan, Stephen, "The Cost of Environmental Regulation in a Concentrated Industry", *Econometrica*, 2012, pp. 1019 - 1061.