

ECO 2901 INDUSTRIAL ORGANIZATION II

University of Toronto. Department of Economics. Spring 2011

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Class meetings: Thursdays, 2:00-4:00pm. Anthropology Building (AP), Room 120.
Office hours: Tuesdays and Thursdays 4:00pm-5:00pm

COURSE DESCRIPTION

This course deals with models, methods, and applications in empirical Industrial Organization. We will study techniques for the estimation of static and dynamic structural models of demand, price competition, market entry-exit, inventories, store location, patent renewal and transfer, investment, product positioning, network competition, and mergers in oligopoly industries. The course emphasizes the importance of combining economic models and econometric techniques to answer empirical questions in Industrial Organization. Using empirical applications, we will illustrate how these models and techniques have been applied to answer empirical questions on market competition and to evaluate the effects of factual and counterfactual policies such as mergers, new products, taxes, environmental policies, or land policies, among others.

MEETINGS

We will have 2 hours of lectures per week on Thursdays 2:00-4:00pm at Room 120 in the Anthropology Building (AP).

EVALUATION

The final grade will be based on two problem sets and a final exam, with a 50% weight for the Problem Sets, and the other 50% for the Final Exam.

TOPICS

1. Basic Concepts on Specification and Estimation of Structural Models of Market Competition
2. Static Models of Market Entry and Competition
3. Estimation of Dynamic Games
4. Dynamic Structural Models of Competition in Oligopoly Industries
5. Models of Network Competition
6. Models of Mergers

OUTLINE AND REFERENCES (The symbol *** indicates a required reading)

1. BASIC CONCEPTS ON SPECIFICATION AND ESTIMATION OF STRUCTURAL MODELS OF MARKET COMPETITION

- 1.1. Measuring market power
- 1.2. Explaining market power
- 1.3. Structural models in empirical IO
- 1.4. An example
- 1.5. An overview of the rest of the course

READINGS:

- *** Bresnahan, T. (1982): "The Oligopolistic Solution Concept is Identified," *Economic Letters*.
- *** Reiss, P., and Wolak, F. (2007): "Structural Econometric Modeling: Rationales and Examples from Industrial Organization," *Handbook of Econometrics*, volume 6. Sections 1-4.
- Bresnahan, T. (1989): "Empirical Studies of Industries with Market Power," *Handbook of Industrial Organization*, vol. II., Schmalensee, R. and Willig, R. (eds.), North-Holland.
- Genesove, D. and W. P. Mullin (1998): Testing static oligopoly models: Conduct and cost in the sugar industry, 1890-1914. *The Rand Journal of Economics* 29 (2), 355–377.
- Schmalensee, R. (1989): "Inter-industry Studies of Structure and Performance," *Handbook of Industrial Organization*, vol. II., Schmalensee, R. and Willig, R. (eds.), North-Holland.
- * Sutton, John (1991): "Sunk Costs and Market Structure: Price Competition, Advertising and the Evolution of Concentration," Cambridge, Mass., MIT Press.

2. STATIC MODELS OF MARKET ENTRY AND COMPETITION

- 2.1. Bresnahan-Reiss model
- 2.2. Estimation of models with multiple equilibria
- 2.3. Product differentiation with endogenous quality and product characteristics
- 2.4. Market entry with incomplete information
- 2.5. Static games of store location.

READINGS:

- *** Bresnahan, Timothy and Peter Reiss (1991): "Entry and Competition in Concentrated Markets," *Journal of Political Economy*, 99, 977-1009.
- *** Bresnahan, T., and P. Reiss (1991): "Empirical Models of Discrete Games," *Journal of Econometrics*, 48, 57-81.

- *** Berry, Steven and Reiss, Peter (2007): “Empirical Models of Entry and Market Structure” Chapter for Volume III of the *Handbook of Industrial Organization*.
- *** Tamer, E. (2003): “Incomplete Simultaneous Discrete Response Model with Multiple Equilibria,” *Review of Economic Studies*, 70(1), 147-165.
- *** Ciliberto, F. and E. Tamer (2009): “Market Structure and Multiple Equilibria in Airline Markets,” *Econometrica*, forthcoming
- *** Seim, K. (2006): “An Empirical Model of Firm Entry with Endogenous Product-Type Choices,” *RAND Journal of Economics*.
- *** Sweeting, A. (2009): "The Strategic Timing of Radio Commercials: An Empirical Analysis Using Multiple Equilibria", *RAND Journal of Economics*, 40(4), Winter 2009.
- Bajari, P., H. Hong, and S. Ryan (2007): “Identification and Estimation of Discrete Games of Complete Information,” Working Paper. University of Minnesota.
 - Bajari, P., H. Hong, J. Krainer and D. Nekipelov (2007): “Estimating Static Models of Strategic Interactions,” Working Paper. University of Minnesota.
 - Berry, S. (1992): “Estimation of a Model of Entry in the Airline Industry,” *Econometrica*, 60(4), 889-918.
 - Berry, S. and J. Waldfogel (2006): “Product Quality and Market Size,” Working Paper. Yale University.
 - Bresnahan, T., and P. Reiss (1990): "Entry in Monopoly Markets", *Review of Economic Studies*, 57, 531-553.
 - Ellickson, P., and S. Misra (2008): “Supermarket Pricing Strategies,” *Marketing Science*.
 - Jia, P. (2008): “What Happens when Wal-Mart comes to town? Empirical Analysis of the Discount Retailing Industry,” *Econometrica*,
 - Mazzeo, M. (2002): “Product Choice and Oligopoly Market Structure,” *The RAND Journal of Economics*, 33(2), 221-242.
 - Reiss, P. (1996): "Empirical Models of Discrete Strategic Choices", *American Economic Review*, 86(2), 421-426.

3. ESTIMATION OF DYNAMIC GAMES

3.1 Multiple Equilibria and Curse of Dimensionality

3.3. One-step methods

3.4. Nested Pseudo Likelihood estimation

3.5 Models with persistent unobserved firm and market heterogeneity

3.6 Multiple equilibria in the data

3.7 Counterfactual experiments

READINGS:

- *** Aguirregabiria, V. and P. Mira (2010): “Dynamic Discrete Choice Structural Models: A Survey,” *Journal of Econometrics*, forthcoming.
- *** Aguirregabiria, V. and P. Mira (2007): “Sequential Estimation of Dynamic Discrete Games,” *Econometrica*, 75, 1-53.
- *** Bajari, P., L. Benkard, and J. Levin (2007): “Estimating Dynamic Models of Imperfect Competition,” *Econometrica*.
- *** Pakes, A., M. Ostrovsky, and S. Berry (2008): “Simple estimators for the parameters of discrete dynamic games (with entry / exit examples),” *RAND Journal of Economics*.
- Akerberg, D., L. Benkard, S. Berry, and A. Pakes (2006): “Econometric Tools for Analyzing Market Outcomes,” *Handbook of Econometrics*, volume 6.
- Aguirregabiria, V. (2004): “Pseudo Maximum Likelihood Estimation of Structural Models Involving Fixed-Point Problems,” *Economics Letters*, 84, 335-340.
- Aguirregabiria, V., H. Roman, and P. Mira (2007): “An Estimable Dynamic Model of Entry, Exit and Growth in Oligopoly Retail Markets,” *American Economic Review*, 97(2), 449-454.
- Holmes, T. (2007): “Diffusion of Wal-Mart and Economies of Density,” Manuscript. University of Minnesota.
- Doraszelski, U. and M. Satterthwaite (2007): “Foundations of Markov-Perfect Industry Dynamics: Existence, Purification, and Multiplicity,” manuscript, Harvard University.
- Kasahara, H. and K. Shimotsu (2007): “Nested Pseudo-likelihood Estimation and Bootstrap-based Inference for Structural Discrete Markov Decision Models,” Manuscript. The University of Western Ontario.
- Pesendorfer, M. and P. Schmidt-Dengler (2008): “Least Squares Estimators for Dynamic Games,” *Review of Economic Studies*, forthcoming.

4. DYNAMIC STRUCTURAL MODELS OF COMPETITION IN OLIGOPOLY INDUSTRIES

- 4.1. Models of Industry Dynamics: Perfect Competition
- 4.2. Models of Industry Dynamics: Oligopoly
- 4.3. Explaining Cross-Industry Heterogeneity in the Dynamics of Market Structure
- 4.4. Environmental Regulation of an Oligopoly Industry

READINGS:

- *** Collard-Wexler, A. (2008): “Demand Fluctuations and Plant Turnover in the Ready-mix Concrete Industry,” manuscript. Stern School of Business.
- *** Dunne, T., M. Roberts and L. Samuelson (1988): “Patterns of Entry and Exit in U.S. Manufacturing,” *Rand Journal of Economics*, 19, 495-515.
- *** Dunne, T., S. Klimek, M. Roberts and Y. Xu (2006): “Entry and Exit in Geographic Markets,” Manuscript. Penn State University.
- *** Ericson, R. and A. Pakes (1995): “Markov-Perfect Industry Dynamics: A Framework for Empirical Work,” *Review of Economic Studies*, 62, 53-82.

- *** Jovanovic, B., (1982): "Selection and the Evolution of Industry", *Econometrica*, 50, 649-670.
- *** Pakes, Ariel and Paul McGuire. 1994. "Computing Markov-perfect Nash Equilibria: Numerical Implications of a Dynamic Differentiated Product Model," *Rand Journal of Economics*, 25, 555-589.
- *** Pakes, A. and R. Ericson (1998): "Empirical Implications of Alternative Models of Firm Dynamics," *Journal of Economic Theory*, 79, 1-45.
- *** Ryan, S. (2005): "The Costs of Environmental Regulation in a Concentrated Industry," manuscript. MIT.
- *** Sweeting, A. (2007): "Dynamic Product Repositioning in Differentiated Product Industries: The Case of Format Switching in the Commercial Radio Industry," NBER WP 13522.
- Benkard, L. (2004): "A Dynamic Analysis of the Market for Wide-Bodied Commercial Aircraft Market," *Review of Economics Studies*.
- Klepper, S. and K. Simons (2000): "The Making of an Oligopoly: Firm Survival and Technological Change in the Evolution of the U.S. Tire Industry," *Journal of Political Economy*, 108(4).
- Schmidt-Dengler, P. (2005): "The Timing of New Technology Adoption: The Case of MRI," manuscript, Yale University.
- Van Biesebroeck, J. and A. Hashmi (2007): "Market Structure and Innovation: A Dynamic Analysis of the Global Automotive Industry," Manuscript. University of Toronto.

5. MODELS OF NETWORK COMPETITION

READINGS:

- *** Aguirregabiria, V. and C. Ho (2007): "A Dynamic Oligopoly Game of the US Airline Industry: Estimation and Policy Experiments," Manuscript. The University of Toronto.
- *** Aguirregabiria, V. and G. Vicentini (2006):
- *** Calzada, J. and T. Valletti (2008): "Network Competition and Entry Deterrence," *The Economic Journal*, Vol. 118, 1223-1244.

6. MODELS OF MERGERS

READINGS:

- *** Gowrisankaran, G. (1999): "A Dynamic Model of Endogenous Horizontal Mergers," *RAND Journal of Economics*, 30, 56-83.
- *** Pesendorfer, M. (2005): "Mergers Under Entry," *The RAND Corporation*, vol. 36(3), 661-679.
- *** Pesendorfer, M. (2003): "Horizontal Mergers in the Paper Industry," *The RAND Corporation*, vol. 34(3), pages 495-515.
- *** Qiu, L. and W. Zhou (2007): "Merger waves: A model of endogenous mergers", *Rand Journal of Economics*, 30(1), 214-226.