

Economics 696F – Topics in Econometrics: Econometrics of Dynamic Industrial Organization Models

University of Arizona, Fall 2010
Mondays, 12:30pm – 3:00pm, McClelland 401KK

Instructor: Prof. Gautam Gowrisankaran, gowrisankaran@eller.arizona.edu, McClelland 401HH
Office hours: By appointment, or just stop by

Course Summary:

The development and estimation of dynamic models to understand industry behavior has been at the forefront of much recent research in econometrics and industrial organization. This course covers recent methodology that has developed and estimated dynamic models of investment and consumer behavior and dynamic oligopoly models. To understand the concepts of the course, it is necessary to be familiar with theory and computation of dynamic models, modern econometric methods and recent questions in industrial organization.

The course meets once a week. Every week, we will cover 1-2 papers related to dynamic estimation of industrial organization models. We will discuss in detail the estimation techniques, model, research question, sources of identification, and economic importance of the work. The idea is to provide enough depth to give students the ability to perform frontier research in this area.

Assignments: There will be 2 computational assignments and an oral final exam. The computational assignments should be done in small groups. Each person will be responsible for separately writing up answers.

Syllabus:

1) Dynamic single-agent models: 3 weeks

Ackerberg, D. A. (2009). "A New Use of Importance Sampling to Reduce Computational Buren in Simulation Estimation." *Quantitative Marketing and Economics* 7, 343-376.

Ackerberg, D. A. (2003). "Advertising, learning, and consumer choice in experience good markets: an empirical examination," *International Economic Review* 44(3). 1007-1040.

Aguirregabiria, V. & Mira, P. (2002). "Swapping the Nested Fixed Point Algorithm: A Class of Estimators for Discrete Markov Decision Models," *Econometrica* 70(4). 1519-1543.

Hotz, V. J. & Miller, R. A. (1993). "Conditional Choice Probabilities and the Estimation of Dynamic Models," *Review of Economic Studies* 60(3). 497-529.

Hotz, V. J.; Miller, R. A.; Sanders, S. & Smith, J. (1994). "A Simulation Estimator for Dynamic Models of Discrete Choice," *Review of Economic Studies* 61(2). 265-89.

Rust, J. (1987). "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher," *Econometrica* 55(5). 999-1033.

2) Dynamic demand models for differentiated products: 4 weeks

For an overview, see Aguirregabiria, V. and Nevo, A. (2010). "Recent Developments in Empirical Demand Models of Demand and Competition in Oligopoly Market," Section 2. Forthcoming, Proceedings of the 10th World Congress of the Econometric Society.
http://individual.utoronto.ca/vaguirre/wpapers/worldcongress_aviv_victor_070810.pdf

Berry, S., Levinsohn, J. and Pakes, A. (2005). "Automobile Prices in Market Equilibrium." *Econometrica* 63, 841-890.

Berry, S. (2004). "Estimating Discrete Choice Models of Product Differentiation." *RAND Journal of Economics* 25, 242-262.

Carranza, J. "Demand for Durable Goods and the Dynamics of Quality." Working paper.

Gowrisankaran, G. & Rysman, M. (2009). "Dynamics of Consumer Demand for New Durable Goods." Working paper.

Hendel, I. & Nevo, A. (2006). "Measuring the Implications of Sales and Consumer Inventory Behavior," *Econometrica* 74(6). 1637-1673.

Lee, Robin S. (2010). "Dynamic Demand Estimation in Platform and Two-Sided Markets." Working paper.

Melnikov, Oleg (2000). "Demand for Differentiated Durable Products: The Case of the US Computer Printer Market." Working paper.

Schiraldi, Pasquale (2010). "Automobile Replacement: A Dynamic Structural Approach." Working paper.

3) Dynamic oligopoly models with discrete choices: 3 weeks

For an overview, see Aguirregabiria, V. and Nevo, A. (2010). "Recent Developments in Empirical Demand Models of Demand and Competition in Oligopoly Market," Section 3. Forthcoming, Proceedings of the 10th World Congress of the Econometric Society.
http://individual.utoronto.ca/vaguirre/wpapers/worldcongress_aviv_victor_070810.pdf

Arcidiacono, P. and Miller, R. (2010). "CCP Estimation of Dynamic Discrete Choice Models with Unobserved Heterogeneity." Working paper.

Aguirregabiria, V. & Mira, P. (2007). "Sequential Estimation of Dynamic Discrete Games,"

Econometrica, **75**(1). 1-53.

Collard-Wexler, A. (2006). "Demand Fluctuations and Plant Turnover in the Ready-Mix Concrete Industry." Working paper.

Dunne, T. & Klimek, S. D. & Roberts, M. J. & Xu, Y. (2009). "Entry, Exit and the Determinants of Market Structure," Working paper.

Pakes, A. & Ostrovsky, M. & Berry, S. (2007). "Simple Estimators for the Parameters of Discrete Dynamic Games (with Entry/Exit Examples)." *RAND Journal of Economics* 38: 373-399.

Pesendorfer, M. & Schmidt-Dengler, P. (2008). "Asymptotic Least Squares Estimators for Dynamic Games," *Review of Economic Studies* **75**(3). 901-928.

4) Dynamic oligopoly models with continuous choices: 3 weeks

Bajari, P. & Benkard, L. & Levin, J. (2007). "Estimating Dynamic Models of Imperfect Competition," *Econometrica* **75**, 1331-70.

Bajari, P. & Hong, H. (2007). "Semiparametric Estimation of a Dynamic Game of Incomplete Information." Working paper.

Berry, S. & Pakes, A. (2000). "Estimation from the First Order Conditions for Dynamic Controls." Working paper.

Doraszelski, U. and M. Satterthwaite (2010). "Computable Markov-Perfect Industry Dynamics." *RAND Journal of Economics* 41, 215-243.

Pakes, A. & McGuire, P. (1994). "Computing Markov-Perfect Nash Equilibria: Numerical Implications of a Dynamic Differentiated Product Model," *RAND Journal of Economics* 25(4). 555-589, Winter.

Pakes, A. & McGuire, P. (2001). "Stochastic Algorithms, Symmetric Markov Perfect Equilibrium, and the 'Curse' of Dimensionality," *Econometrica*, 69(5). 1261-81, September.

5) Other approaches and empirical implementations: 3 weeks

Benkard, C. L. (2004). "A Dynamic Analysis of the Market for Wide-Bodied Commercial Aircraft," *Review of Economic Studies*. 71(7). 581-611.

Chen, J. & Esteban, S. & Shum, M. (2008). "How Much Competition is a Secondary Market?" Working paper.

Esteban, S. & Shum, M. (2007). "Durable-Goods Oligopoly with Secondary Markets: the Case

of Automobiles,” *RAND Journal of Economics* **38**(2).

Goettler, R. L. & Gordon, B. R. (2008). “Durable Goods Oligopoly with Innovation: Theory and Empirics.” Working paper.

Gowisankaran, G. and R. Town (1997). “Dynamic Equilibrium in the Hospital Industry.” *Journal of Economics & Management Strategy* 6: 45-74.

Gowrisankaran, G. & Lucarelli, C. & Schmidt-Dengler, P. & Town, R. (2010). “Government Policy and the Dynamics of Market Structure: Evidence from Critical Access Hospitals.” Mimeo.

Holmes, T. J. (2010). “The Diffusion of Wal-Mart and Economies of Density.” *Econometrica*, forthcoming.

Ryan, Stephen (2009). “The Costs of Environmental Regulation in a Concentrated Industry.” Working paper.

Schmidt-Dengler, P. (2008). “The Timing of New Technology Adoption: The Case of MRI.” Working paper.

Sweeting, A. (2009). “Dynamic Product Repositioning in Differentiated Product Industries: The Case of Format Switching in the Commercial Radio Industry.” Working paper.

Xu, Daniel (2008). “A Structural Empirical Model of R&D Investment, Firm Heterogeneity, and Industry Evolution.” Working paper.