

ECO 637: Industrial Organization II
SUNY at Stony Brook
Spring Semester, 2002

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Lectures: Tu Th 2:20 - 3:40 p.m. at SBS-S632
Office Hours: Tu 11:30 a.m. - 12:30 p.m., Th 1 p.m. - 2 p.m., or by appointment

Course Description: In this course, we discuss several analytic frameworks and their applications to various topics in Industrial Organization. The emphasis will be given to discrete choice models, single-firm dynamic problems, dynamic equilibrium models with heterogeneous firms, and innovation and productivity measurements.

Grading: The grade for this course will be based on three home-works (**35%**), one in-class presentation of a designated paper (**15%**) and a final term paper (**50%**). The final term paper should include an in-depth literature review on some topic, addressing potentially interesting research questions in the connection with the materials discussed in the course.

Course Outline:

- I. Introduction (½ week)
- II. Product Differentiation and Discrete Choice Models (2½ weeks)
: logit model; nested logit model; random-coefficient model;
multi-product firm; dynamic models of discrete choice.
- III. Single-firm Dynamic Problems (4½ weeks)
: introduction to dynamic programming; entry/exit decision with sunk costs;
(s, S) inventory problem.
- IV. Dynamic Equilibrium Models with Heterogeneous Firms (3 weeks)
: evolution of industry; Lippman-Rumelt model; Ericson-Pakes model;
Markov perfect equilibrium and computational issues.
- V. Innovation and Productivity Measurement (1 week)
- VI. Student Presentations (2 weeks)

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, I would urge that you contact the staff in the Disabled Student Service office (DSS), Room 133 Humanities, 632-6748/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential.

Reading List

You are highly recommended to read the starred papers.

I. INTRODUCTION

- * Bresnahan, T. (1989): "Industries with Market Power," in *Handbook of Industrial Organization*, Ch. 17, ed. by R. Schmalensee and R. Willig, Elsevier Science B.V.
- * Schmalensee, R. (1989): "Studies of Structure and Performance," in *Handbook of Industrial Organization*, Ch. 16, ed. by R. Schmalensee and R. Willig, Elsevier Science B.V.

Carlton D. and J. Perloff (2000): *Modern Industrial Organization*, third edition, Addison Wesley Longman, Inc.

Tirole, J. (1988): *The Theory of Industrial Organization*, Cambridge: MIT Press.

II. PRODUCT DIFFERENTIATION AND DISCRETE CHOICE MODELS

Anderson, S., A. de Palma, and J. Thisse (1992): *Discrete Choice Theory of Product Differentiation*, Cambridge: MIT Press.

* Berry, S. (1994): "Estimating Discrete Choice Models of Product Differentiation," *RAND Journal of Economics*, 25, 242-262.

* Berry, S. and A. Pakes (1999): "Estimating the Pure Hedonic Discrete Choice Model," mimeo., Yale University.

* Berry, S., J. Levinsohn and A. Pakes (1995): "Automobile Prices in Market Equilibrium," *Econometrica*, 63, 841 - 890.

_____ (1999): "Voluntary Export Restraints on Automobiles: Evaluating a Trade Policy," *American Economic Review*, 89(3), 400-30.

Bresnahan T. F., Stern, S. and Trajtenberg, M (1997): "Market Segmentation and the Source of Rents from Innovation: Personal Computers in the late 1980s," *Rand Journal of Economics*, 28, S17-S44.

Caplin, A. and B Nalebuff (1991): "Aggregation and Imperfect Competition: On the Existence of Equilibrium," *Econometrica*, 59, 26 - 61.

Cardell, N. S. (1997): "Variance Components Structures for the Extreme Value and Logistic Distributions with Applications to Models of Heterogeneity," *Econometric Theory*, 13, 185-213.

Currie, G. and S. Park (2001): "The Effects of Marketing and Consumption Experience on Demands for Antidepressant Drugs," mimeo., SUNY at Stony Brook.

Hausman, J. and D. Wise (1978): "A Conditional Probit Model for Qualitative Choice: Discrete Decision Recognizing Interdependence and Heterogeneous Preferences," *Econometrica*, 46, 403-426.

Hendel, I. (1999): "Estimating Multiple-Discrete Choice Models: An Application to Computerization Returns," *Review of Economic Studies*, 66, 423 - 446.

McFadden, D (1973): "Conditional Logit Analysis of Quantitative Choice Behavior," in *Frontiers in Econometrics*, ed. by P. Zarembka, New York, Academic.

_____ (1981): "Econometric Models of Probabilistic Choice," in *Structural Analysis of Discrete Data with Econometric Applications*, ed. by C. Manski and D. McFadden,

Cambridge, MIT.

- Nevo, Aviv (2001): "Measuring Market Power in the Ready-to-Eat Cereal Industry," *Econometrica*, 69, 343 - 376.
- * Rust, J. (1987): "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher," *Econometrica*, 55, 999 - 1033.
- Train, K. E., D. McFadden, and M. Ben-Akiva (1987): "The Demand for Telephone Service: A Fully Discrete Model of Residential Calling Patterns and Choices," *Rand Journal of Economics*, 18, 109 - 123.

III. SINGLE-FIRM DYNAMIC PROBLEMS

- Caplin, A. (1985): "The Variability of Aggregate Demand with (s, S) Inventory Policies," *Econometrica*, 1395-1409.
- Dixit, A. (1989): "Entry and Exit Decision under Uncertainty," *Journal of Political Economy*, 97, 620 - 638.
- Jovanovic, B. (1979): "Job Matching and the Theory of Turnover," *Journal of Political Economy*, 972 - 990.
- * Pakes, A. (1986): "Patents as Options: Some Estimates of the Value of Holding European Patent Stocks," *Econometrica*, 54, 755 - 784.
- * Stokey, N., R. Lucas, and E. Prescott (1989): *Recursive Methods in Economic Dynamics*, Harvard University Press, Chs. 3 and 9.

IV. DYNAMIC EQUILIBRIUM MODELS WITH HETEROGENEOUS FIRMS

- Aguirregabiria, V. (1999): "The Dynamics of Markups and Inventories in Retailing Firms," *Review of Economic Studies*, 66, 275 - 308.
- Begg, S., and P. Klemperer (1992): "Multi-Period Competition with Switching Costs," *Econometrica*, 60, 651-666.
- Benkard, C. L. (2000): "Dynamic Equilibrium in the Commercial Aircraft Market," mimeo., Stanford University.
- Berry, S. (1992): "Estimation of a Model of Entry in the Airline Industry," *Econometrica*, 60, 889 - 917.
- Berry, S. and A. Pakes (2000): "Estimation from the Optimality Conditions for Dynamic Controls," mimeo., Yale University.
- Caballero, R. J. and E. M. R. A. Engle (1999): "Explaining Investment Dynamics in U.S. Manufacturing: A Generalized (S, s) Approach," *Econometrica*.
- Dixit, A. (1989): "Hysteresis, Import Penetration, and Exchange Rate Pass-Through," *Quarterly Journal of Economics*, 205-228.
- * Ericson, R. and A. Pakes (1995): "Markov Perfect Industry Dynamics: A Framework for Empirical Work," *Review of Economic Studies*, 62, 53-82.
- Fershtman, C. and A. Pakes (2000): "A Dynamic Oligopoly with Collusion and Price Wars," *Rand Journal of Economics*, 31, 207-236.
- Fudenberg, D. and J. Tirole (1992): *Game Theory*, Cambridge: MIT Press, Ch. 13.
- Hopenhayn, H. A. (1992): "Entry, Exit, and Firm Dynamics in the Long Run," *Econometrica*, 60, 1127-1150.
- * Jovanovic, B. (1982): "Selection and the Evolution of Industry," *Econometrica*, 50, 649-670.

- * Lippman, S. A. and R. P. Rummelt (1982): "Uncertain Imitability: An Analysis of Interfirm Differences Under Competition," *Bell Journal of Economics*, 13, 418-438.
- Lucas, R. E. (1978): "On the Size Distribution of Business firms," *Bell Journal of Economics*, 9, 508-523.
- Maskin, E. and J. Tirole (1988(a)): "A Theory of Dynamic Oligopoly I: Overview and Quantity competition with Large fixed Costs," *Econometrica*, 56, 549 - 570.
- _____ (1988(b)): "A Theory of Dynamic Oligopoly II: Price Competition," *Econometrica*, 56, 571 - 600.
- _____ (1987): "A Theory of Dynamic Oligopoly III: Cournot Competition," *European Economic Review*, 31, 947 - 968.
- _____ (1993): "Markov Perfect Equilibria," manuscript, Harvard University.
- Pakes, A. (1994): "Dynamic Structural Models, Problems and Prospects: Mixed Continuous Discrete Controls and Market Interactions," in *Advances in Econometrics*, ed. by J. J. Laffont and C. Sims.
- * Pakes, A., and P. McGuire (1994): "Computation of Markov Perfect Nash Equilibria I: Numerical Implications of a Dynamic Product Model," *RAND Journal of Economics*, 25, 555-589.
- _____ (2001): "Stochastic Algorithm, Symmetric Markov Perfect Equilibrium, and the 'Curse' of Dimensionality," *Econometrica*, 69, 1261 - 1282.
- Park, S. (2001(a)): "Quantitative Analysis of Network Externalities in Competing Technologies: the VCR Case," mimeo., SUNY at Stony Brook.
- _____ (2001(b)): "Semiparametric Instrumental Variables Estimation and its Application to Dynamic Oligopoly," mimeo., SUNY at Stony Brook.
- _____ (2001(c)): "Learning Curve Optimization and the 1986 Semiconductor Trade Arrangement," mimeo., SUNY at Stony Brook.
- Sutton, J. (1991): *Sunk Costs and Market Structure: Price Competition, Advertising, and the Evolution of Concentration*, Cambridge, Mass. And London: MIT Press.
- _____ (1996): "Technology and Market Structure," *European Economic Review*, 40, 511-530.
- * _____ (1997): "Gibrat's Legacy," *Journal of Economic Literature*, 35(1), 40-59.

V. INNOVATION AND PRODUCTIVITY MEASUREMENT

- Berndt, E. R., Z. Griliches, and N. J. Rappaport. (1995): "Econometric Estimates of Price Indexes for Personal Computers in the 1990's," *Journal of Econometrics*, 68, 243-68.
- Choi, J. P. (1991): "Dynamic R&D Competition under Hazard Rate Uncertainty," *RAND Journal of Economics*, 22(4), 596-610.
- Jaffe, A. and M. Trajtenberg (1999): "International Knowledge Flows: Evidence from Patent Citations," *Economics of Innovation and New Technology*, 8, 105-136.
- Malueg, D. A. and S. O. Tsutsui (1997): "Dynamic R&D Competition with Learning," *RAND Journal of Economics*, 28, 751 - 772.
- * Olley, S. and A. Pakes (1996): "The Dynamics of Productivity in the Telecommunication Equipment Industry," *Econometrica*, 64, 1263 - 1298.
- Park, S. (2001(d)): "Innovation-and-Learning-Adjusted Price Indexes for Prescription Drugs," mimeo., SUNY at Stony Brook.
- Reinganum, J. (1982): "A Dynamic Game of R&D: Patent Protection and Competitive Behavior," *Econometrica*, 50(3), 671-688.
- _____ (1983): "Uncertain Innovation and the Persistence of Monopoly," *American Economic Review*, 73, 71-748

*_____ (1985): "Innovation and Industry Evolution," *Quarterly Journal of Economics*, 81-99.

Trajtenberg, M. (1990): "Product Innovation, Price Indices and the (Mis)Measurement of Economic Performance," NBER Working Paper #3261.