UNIVERSITY of HOUSTON

Empirical Industrial Organization

Spring Semester 2019

10:00 am – 11:30 am, Tuesday-Thursday, McElhinney Hall, Room 109

Contact information

Instructor:

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http://www.uh.edu/~aszabo2/appointments.htm

Course Description

This course provides a graduate-level introduction to empirical industrial organization, both in terms of techniques and applications. We will discuss leading papers in the field of empirical IO covering the estimation of several models and their applications. This class differs somewhat from the course offered under the same class number in previous years.

1. Models of product differentiation.
We estimate demand systems for differentiated products, which gives us a framework to estimate own and cross price elasticities, estimate markups, measure market power, evaluate mergers, quantify the benefits of a new product, evaluate the effect of discontinuing a product, examine how information asymmetry (advertising) affects demand estimation and the resulting substitution patterns.

2. Estimating production functions. We study recent advances in production estimation techniques, which includes computing productivity and misallocation measures.

3. Single agent dynamic models, Dynamic games of imperfect competition.
We provide a framework to estimate discrete choice dynamic models. We start with the estimation of single agent dynamic models, such as the optimal investment model. Next, we study the estimation of multiplayer dynamic games. Our main focus is on models of firm entry and exit in oligopoly markets. We analyze industry pricing, industry performance, and optimal industry policy, and measure the welfare cost of government regulations.

4. The last part of the class introduces recent advances in dynamic durable goods models and models of storable goods to study consumers' inventory behavior and intertemporal substitution.

Prerequisites

Students are expected to have taken PhD level Microeconomic Theory and Econometrics classes. Students also need to have basic knowledge of dynamic optimization. Programming in STATA and MATLAB will be required to complete homework assignments.

Textbook and software

There is no specific textbook for this class. We will be using a combination of lecture notes and journal articles. The required articles are listed below in each section. The additional reading list provides background reading on the topics and serves as a reference to your lecture notes.

You will be required to use STATA and MATLAB software packages. Public versions of these are available in the department's graduate computer lab. STATA is available for purchase at a discounted price at the Cougarbyte website and MATLAB is available for free for UH students.

Students should familiarize themselves with the software packages in order to program the homework exercises. Although we will briefly discuss how to implement specific estimation methods in MATLAB, the class does not provide an introduction to basic computer programming.

Course Requirements

The class schedule below contains the main papers we are going to discuss during each class. Students are expected to complete the assigned readings before attending class. For each topic, I will provide an overview of the literature, and we will discuss the assigned paper in detail. Depending on the class, we may spend more time on the overview and less on the details. Students are required to fully understand the assigned papers regardless of how much time we spend on them in class. All of these papers will be part of the final exam.

The course has some difficult econometrics, and it is expected that students have a basic comfort level with estimation. It is also expected that students will do requisite background readings in econometric theory where necessary. This class will be rather demanding.

There will be 4 homework assignments and a final exam. See below.

Assignments and Grading

The final grade is based on four homework exercises and a final exam.

Please be prepared to work on these homeworks for several weeks. The due dates for homework assignments are listed in the class schedule.

The final exam will be posted in Blackboard after the last day of classes. You can access it any time until **May 2, 11.59 pm**. You will have 24 hours to complete the exam and upload your answers in Blackboard.

The final exam is worth 33% and the homework assignments are worth 66% of your final grade. To receive any grade other than “F” or “Incomplete”, a student is required to submit all assignments. There is no exception.

Class Website

All assignments and handouts will be posted on the class website in Blackboard. Go to http://www.uh.edu/blackboard and click the white "Blackboard Learn" button. Log in with your CougarNet ID and password. Please do not email me homework files, upload everything on Blackboard.

Tentative Course Schedule:

Class #	Date/Day			Topic	Problem Sets
Welcome to IO					
1	Jan	15	T	Reiss, P. C. and Wolak, F. A. (2003): "Structural Econometric Modeling: Rationales and Examples from Industrial Organization" in *Handbook of Econometrics*, North Holland, 2007.	
2		17	Th	Keane, Michael P. (2010): "Structural vs. atheoretic approaches to econometrics," *Journal of Econometrics*, 156(1), 3-20. Rust, J. (2010): "Comments on: "Structural vs. atheoretic approaches to econometrics" by Michael Keane," *Journal of Econometrics*, 156(1), 21–24.	
I. Models of product differentiation					
3-4		22, 24	T, Th	Berry, S. (1994): "Estimating Discrete-Choice Models of Product Differentiation," *Rand Journal of Economics*, 25(2), 242-262.	
5-6		29, 31	T, Th	Berry, S., J. Levinsohn, and A. Pakes (1995): "Automobile Prices in Market Equilibrium," *Econometrica*, 63(4), 841-890.	
7-8	Feb	5, 7	T, Th	Nevo, A. (2001): "Measuring Market Power in the Ready-to-Eat Cereal Industry," *Econometrica,* 69, 307-342. Nevo, A. (1998): "A Practitioner's Guide to Estimation of Random-Coefficients Logit Models of Demand," *Journal of Economics and Management Strategy,* 9(4), 513-548.	
9-10		12, 14	T, Th	Petrin A. (2002): "Quantifying the Benefits of New Products: The Case of the Minivan", *Journal of Political Economy*, 110, 705-729. Berry S., J. Levinsohn, and A. Pakes (2004): "Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The New Cars Market," *Journal of Political Economy*, 112(1), 68-105. Goeree M. (2009): "Limited Information and Advertising in the U.S. Personal Computer Industry," *Econometrica*, 76(5), 1017–1074.	
11-12		19, 21	T, Th	Leung, T.C. (2013): "What is the True Loss Due to Piracy? Evidence from Microsoft Office in Hong	Febr. 21: PS 1 Due

				Kong," *The Review of Economics and Statistics*, 95(3), 1018–1029 A. Szabo and V. Pham (2019): "Net Neutrality and Consumer Demand in the Video On-demand Market," WP, Download from Blackboard	
13-14		26, 28	T, Th	S. Olley and A. Pakes (1996): "The Dynamics of Productivity in the Telecommunications Equipment Industry," *Econometrica,* 64, 1263-98. A. Petrin and J. Levinsohn (2003): "Estimating Production Functions Using Inputs to Control for Unobservables," *Review of Economic Studies*, 70(2), 317-342. Wooldridge, J. M. (2009): "On Estimating Firm-Level Production Functions Using Proxy Variables to Control for Unobservables," *Economics Letters* 104(3), 112-114.	
15-16	March	5, 7	T	Asker, J., A. Collard-Wexler, and J. De Loecker (2014): "Dynamic Inputs and Resource (Mis)Allocation," *Journal of Political Economy 122(51), 1013-1063.* Ackerberg, D. A., K. Caves, and G. Frazer (2015): "Identification Properties of Recent Production Function Estimators," *Econometrica*, 83(6), 2411-2451. Gandhi, A., S. Navarro and D. Rivers (2017): "On the Identification of Gross Output Production Functions," Working Paper.	
17		12	T	*No class. Spring Break.*	
18		14	Th	*No class. Spring Break.*	
19		19	T	Overview of dynamic programming. Value function. Markov Perfect Equilibrium Concept. Rust, J. (1987): "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher," *Econometrica* 55(5), 999-1033.	PS 2 Due
20		21	Th	Rust, J. (1994): "Structural Estimation of Markov Decision Processes," in: Handbook of Econometrics, Vol. 4 Ch. 51, 3081-3143.	
21		26	T	Hotz, V. J. and R. A. Miller (1993): "Conditional Choice Probabilities and the Estimation of Dynamic Models," *Review of Economic Studies*	

				60(3), 497-529.	
22		28	Th	Bajari, P., L. Benkard and J. Levin (2007): "Estimating Dynamic Models of Imperfect Competition," *Econometrica* 75(5), 1331-70.	
23-24	April	2, 4	T, Th	Benkard, L. (2004): "Dynamic Analysis of the Market for Wide-Bodied Commercial Aircraft," *Review of Economic Studies,* 71, 581-611. S. P. Ryan (2012): "The Costs of Environmental Regulation in a Concentrated Industry," *Econometrica*, 80(3), 1019–1061.	
25-26		9, 11	T, Th	Hendel, I. and A. Nevo (2006): "Measuring the Implications of Sales and Consumer Inventory Behavior," *Econometrica*, 74(6), 1637-1673. Hendel, I. and A. Nevo (2006): "Sales and Consumer Inventory," *RAND Journal of Economics*, 37(3), 543-561.	April 9: PS 3 Due
27		16	T	Hendel, I. and A. Nevo (2013): "Intertemporal Price Discrimination in Storable Goods Market," *American Economic Review*, 103(7), 2722-2751.	
28		18	Th	Gowrisankaran, G. and M. Rysman (2012): "Dynamics of Consumer Demand for New Durable Goods, forthcoming: *Journal of Political Economy,* 120, 1173-1219. Gowrisankaran, G., M. Rysman and G. Wei Yu (2015): "Computing Price-Cost Margins in Durable Goods Environment", WP.	
Closing					
29		23	T	Current topics in IO.	
30		25	Th	Discussion of final exercise	PS 4 Due