**ECONOMICS 600a**
**YALE UNIVERSITY**
**Prof. Phil Haile**
**37 Hillhouse, Rm 26**
**philip.haile@yale.edu**

**Overview and Objectives.** Michi Igami and I are teaching the fall term of the IO sequence. I will teach the first half and will focus on demand, supply, and competition in differentiated products markets. Relative to later parts of the course we will spend a bit more time on tools, although we will cover a number of applications, including several on horizontal and vertical merger analysis.

My primary goals: introduce you to some of the key questions and technical challenges that arise in using data to understand the functioning of markets; get you comfortable with some fundamental tools of empirical IO; discuss some prominent applications of those tools to questions about the functioning of markets and competition policy; and introduce topics of frontier research in this area.

**Zoom.** We will meet via zoom. The meeting link and password are on the Canvas web page for the course. Please do not share these. I strongly prefer that you have your camera on during the meeting; this will preserve some of the visual feedback I rely on to sense engagement, confusion, etc.

**Course Requirements.** *For my part of the course*, students are expected to (1) read the papers assigned for each class meeting; (2) prepare a 1-page summary of an assigned paper for each class meeting; and (3) participate in the class discussions of papers, and (4) do one major homework assignment. Grades will be based on the quality of the required work for the course. Late assignments generally will not be given credit. However, I will drop the lowest grade on the one-page summaries from my portion of each student's evaluation.

**Summaries.** The one-page summaries must be written independently and are due on Canvas by the beginning of each class meeting. You should describe the objectives, contributions, and key ideas of the paper. Typically this should be done with words and complete sentences (not an outline or list of bullet points). Sometimes a key equation may be necessary to convey an essential idea, but resist the temptation to substitute notation and equations for insights and ideas. Good summaries will usually make clear that you read the whole paper, not just the authors' summary in the introduction! These summaries should not be critiques or "responses," although sometimes describing what is vs. is not addressed in the paper is a good way to make its contributions clear. Do not write more than one page.

Preliminary Schedule of Topics and Papers

* indicates the papers on which you should prepare the one-page summary

changes may be announced in class

**Intro to IO and Differentiated Products Markets**

Sep 1. *Berry (1994)

**The BLP Model and Estimation, Quantifying the Sources of Market Power**

Sep 3. *Berry, Levinsohn, and Pakes (1995), Dube, Fox and Su (2012a)

Sep 8. BLP, *Conlon and Gortmaker (2020), Nevo (2001)

**Horizontal Mergers.**

Sep 10. Horizontal Merger Guidelines (2010), *Nevo (2000)

Sep 15. *Fan (2013)

**Micro Data, Panel Data, New Goods**

Sep 17. *Petrin (2001)

Sep 22. *Berry, Levinsohn, and Pakes (2004)

**Nonparamteric Foundations and Extensions**

Sep 24. Berry, Gandhi, and Haile (2013), Berry and Haile (2014, 2016, *2020a)

Sep 29. Berry and Haile 2016, *Compiani (2020)

**Consideration Sets, Inertia, Advertising, and Search**

Oct 1. *Dube, Hitsch, and Rossi (2010)

Oct 6. *Goeree (2008)

Oct 8. Hong and Shum (2006), *Hortacsu and Syverson (2004)

**Vertical Relations, Bargaining, and Vertical Mergers**

Oct 13. *Crawford, Lee, Whinston and Yurukoglu (2018)

## READING LIST

Despite being long, this list is not complete nor even my selection of the best papers on the topics we will cover. However it should be sufficient to get you going if topics we cover interest you enough for further exploration.

### Basic IO Theory

Tirole, J. (1988). *The Theory of Industrial Organization*, MIT Press. This text is outdated and only slightly more advanced than of what I teach Yale undergrads. On the other hand, it covers core models every IO economist should be familiar with. Graduate students rarely arrive with knowledge of this material, and many conceptual errors in empirical work can be avoided by paying attention to the relevant economic theory. If you want to be an IO economist (or any kind of economist studying firms), you should buy the book and work through it.

### Handbook Chapters in Empirical IO

There are several handbook chapters on modern IO. Together these provide excellent resources on methods, as well as an overview of applications in some areas. A new Handbook of IO is due to be published in 2021.

Ackerberg, D., L. Benkard, S. Berry, and A. Pakes (2007). "Econometric Tools for Analyzing Market Outcomes." Demand estimation, production function estimation, dynamics, and entry. *Handbook of Econometrics.*

Athey, S. and P. Haile (2007), "Nonparametric Approaches to Auctions," Auctions, focusing on methods. *Handbook of Econometrics.*

Hendricks, K. and R. Porter (2007), "An Empirical Perspective on Auctions." Auctions, focusing on applications. *Handbook of IO.*

Reiss, P. and F. Wolak (2007), "Structural Econometric Modeling: Rationales and Examples from I.O." *Handbook of Econometrics.*

Reiss, P. and S. Berry (2007), "Entry." *Handbook of IO.*

### Differentiated Products Supply, Demand, and Mergers

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

Bartik, M. (1987). "The Estimation of Demand Parameters in Hedonic Pricing Models," *Journal of Political Economy*, 95, 81–88.

Berry, S. (1994). "Estimating Discrete Choice Models of Product Differentiation," *Rand Journal of Economics*, 242–262.

Berry, S. A. Gandhi and P. Haile (2013). "Connected Substitutes and Invertibility of Demand," *Econometrica*, 81, 2087-2111.

Berry, S. and P. Haile (2020a). "Nonparametric Identification of Differentiated Products Demand Using Micro Data," working paper, Yale.

Berry, S. and P. Haile (2020b). "Foundations of Demand Estimation," for the *Handbook of Industrial Organization*, working paper, Yale.

Berry, S. and P. Haile (2018). "Identification in Differentiated Products Markets using Market Level Data," *Econometrica*, 82, 1749–1798.

Berry, S. and P. Haile (2016). "Identification in Differentiated Products Markets," *Annual Review of Economics*.

Berry, S. and P. Haile (2018). "Identification of Nonparametric Simultaneous Equations Models with a Residual Index Structure," *Econometrica*.

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

Berry, S., J. Levinsohn, and A. Pakes (1999): "Voluntary Export Restraints on Automobiles: Evaluating a Strategic Trade Policy," *American Economic Review*, 89(3).

Berry, S., J. Levinsohn, and A. Pakes (2004). "Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The New Car Market," *Journal of Political Economy*, 112, 68–105.

Bresnahan, T. (1981). "Departures From Marginal Cost Pricing in the American Automobile Industry," Journal of Econometrics, 17, 201–227.

Bresnahan, T. (1987). "Competition and Collusion in the American Auto Industry: The 1955 Price War," *Journal of Industrial Economics*, 35, 457–482.

Capps, C., D. Dranove and M. Satterthwaite (2003). "Competition and Market Power in Option Demand Markets," Rand Journal of Economics, 34(4), pp. 737-763.

Collard-Wexler, A., Gowrisankaran, G., and Lee, R. S. (2018). "Nash-in-Nash" Bargaining: A Microfoundation for Applied Work ," *Journal of Political Economy*.

Compiani, G. (2020). "Market Counterfactuals and the Specification of Multiproduct Demand: A Nonparametric Approach," working paper, University of Chicago

Conlon, C. and J. Gortmaker (2020). "Best Practices for Demand Estimation with pyBLP," RAND Journal of Economics, forthcoming.

Crawford, G., R. Lee, M. Whinston, and A. Yurukoglu (2018). "The Welfare Effects of Vertical Integration in Multichannel Television Markets," *Econometrica*, 86, 891–954.

Crawford, G. S., and Yurukoglu, A. (2012). "The Welfare Effects of Bundling in Multichannel Television Markets," *American Economic Review,* 102(2), 643-685.

Dube, J.-P., J. Fox and C.-L. Su, (2012a) "Improving the Numerical Performance of Static and Dynamic Aggregate Discrete Choice Random Coefficients Demand Estimation," *Econometrica*, 80, 2231–2267.

Dube, J.-P., J. Fox and C.-L. Su, (2012b) "Supplement to 'Improving the Numerical Performance of Static and Dynamic Aggregate Discrete Choice Random Coefficients Demand Estimation'."

Dube, J.-P., G. Hitsch and P. Rossi (2010). "State Dependence and Alternative Explanations for Consumer Inertia," RAND Journal of Economics, 41, 417–445.

Fan, Y. (2013). "Ownership Consolidation and Product Quality: A Study of the U.S. Daily Newspaper Market," American Economic Review, 103, 1598–1628.

Gandhi, A. and J.-F. Houde (2017). "Measuring Substitution Patterns in Differentiated Products Markets," working paper, University of Wisconsin.

Goeree, M. (2008). "Limited Information and Advertising in the U.S. Personal Computer Industry," *Econometrica*.

Goldberg, P. (1995). "Product Differentiation and Oligopoly in International Markets," Econometrica, 63, 891–951.

Goolsbee, A. and A. Petrin (2004). "The Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV," *Econometrica*, 72, 251–382.

Gowrisankaran, G., Nevo, A. and Town, R. (2015): Mergers when Prices are Negotiated: Evidence from the Hospital Industry, *American Economic Review*, 105, 172-203.

Grennnan, M. (2013): Price Discrimination and Bargaining" Empirical Evidence from Medical Devices, *American Economic Review*, 103, 145-177.

Hausman, J., G. Leonard, and D. Zona (1994). "Competitive Analysis with Differentiated Products," Annales d'Economie et de Statistique, 34, 159–80.

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

Ho, K., and Lee, R. S. (2017). "Insurer Competition in Health Care Markets, *Econometrica*, 85(2), 379-417.

Horn H. and A. Wolinsky (1988). "Bilateral Monopolies and the Incentives for Merger," *RAND Journal of Economics*, 19, 408-419.

Hortacsu, A. and C. Syverson (2004). "Product Differentiation, Search Costs, and Competition in the Mutual Fund Industry: A Case Study of S&P 500 Index Funds" *Quarterly Journal of Economics*, May.

Neilson, C. (2019). "Targeted Vouchers, Competition Among Schools, and the Academic Achievement of Poor Students," working paper, Princeton University.

Nevo, A. (2001). "Measuring Market Power in the Ready-to-Eat Breakfast Cereal Industry," *Econometrica*,69, 307–342.

Nevo, A. (2000). "Mergers with Differentiated Products: The Case of the Ready-to-Eat Cereal Industry," RAND, 31, 395–421.

Petrin, A. (2001). "Quantifying the Benefits of New Products: The Case of the Minivan," *Journal of Political Economy*.

Quan, T. and K. Williams (2016), "Product Variety, Across-Market Demand Heterogeneity, and the Value of Online Retail," working paper, Yale.

Reynaert, M., and F. Verboven (2014): "Improving the performance of random coefficients demand models: The role of optimal instruments," *Journal of Econometrics*, 179(1).

Reynaerts, J. , R. Varadhan, and J. Nash ( 2012). "Enhancing the Convergence Properties of the BLP (1995) Contraction Mapping," Working Papers VIVES Research Centre for Regional Economics 35, KU Leuven.

Small, K. and S. Rosen (1981). "Applied Welfare Analysis with Discrete Choice Models," *Econometrica*, 49, 105–130.

Train, K. (2003). Discrete Choice Methods with Simulation„ Cambridge U. Press, also available on Train's web page.

U.S. DOJ and FTC (2010), 2010 Horizontal Merger Guidelines, available at *http://www.justice.gov/atr/public/guidelines/hmg-2010.html*