

Empirical Industrial Organization Fall 2021

Lecturer: Philipp Schmidt-Dengler

Phone: +43-1-4277-37465

email: philipp.schmidt-dengler@univie.ac.at

Office Hours: by appointment

Time and Location: TBA

Course Description: This course introduces students to empirical methods in Industrial Organization and Competition Policy. There will be “problem sets” based on the readings, in which students will use econometric software to apply the introduced techniques. Students should make sure you have access to the relevant computer programs, such as R, Stata or similar software. You are free to use whichever software you prefer. As a student I learned to use commercial software packages like Gauss, Matlab, Stata etc. but I think it is preferable to learn and use free packages like Octave, Python, or R.

Readings:

The following book provides a very thorough general coverage of the topics of this course. I strongly recommend that you obtain a personal copy also for future reference:

Davis, Peter, and Eliana Garcés. Quantitative techniques for competition and antitrust analysis. Princeton University Press, 2009.

There are also two manuscripts which cover several topics in this course.

- Verboven, F. (2012) *Empirical Industrial Organization and Competition Policy*, available online at <https://sites.google.com/site/frankverbo/manuscript>
- Aguirregabiria, Victor (2019), at *Empirical Industrial Organization*, available online at http://aguirregabiria.net/wpapers/book_dynamic_io.pdf

References by topic (starred readings are required readings):

1. Introduction: The History of IO, Main Research Questions and Challenges

Bain, J. (1956), *Barriers to New Competition*. Harvard, Cambridge MA.

(*) Bresnahan, T. (1988) “Empirical Studies of Industries with Market Power”, Chapter in the *Handbook of Industrial Organization*, vol 2, 1010-57, North Holland, New

York, .

Demsetz, H. (1973): “Industry Structure, Market Rivalry and Public Policy,” *The Journal of Law and Economics*, 16, 1–9.

Evans, D. (1987): “The Relationship Between Firm Growth, Size and Age,” *Journal of Industrial Economics*, 5, 567–581.

Haltiwanger, J., and S. Davis (1992): “Gross Job Destruction and Employment Reallocation,” *Quarterly Journal of Economics*, 107, 819–862.

Ravenscraft, D. (1983): “Structure-Profit Relationships at the Line of Business and Industry Level,” *Review of Economics and Statistics*, 65,22–31.

Simon, and Bonini (1958): “The Size Distribution of Business Firms,” *American Economic Review*, 48, 607–17.

2. Demand and Cost Estimation in Homogeneous Goods Markets, Identification of Conduct

(*)Bresnahan, T. (1988) “Empirical Studies of Industries with Market Power”, Chapter in the *Handbook of Industrial Organization*, vol 2, 1010-57, North Holland, New York, .

(*)Bresnahan, Timothy F. (1982): The oligopoly solution is identified, *Economic Letters*, 10, 87-92.

(*) Porter, R.H. (1983) “A Study of Cartel Stability: The Joint Executive Committee, 1880-1886,” *The Bell Journal of Economics*, 301-314.

(*) Genesove, D. and W. P. Mullin (1998), “Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914,” *RAND Journal of Economics*, 355-377 .

3. Differentiated Products Markets

*Berry, S. (1994): “Estimating Discrete Choice Models of Product Differentiation,” *Rand Journal of Economics*, 25(2), 242-262.

Berry, S., J. Levinsohn, and A. Pakes (1995): “Automobile Prices in Market Equilibrium”, *Econometrica*, 63(4), pp 841-890.

Goldberg, P.K. (1995): "Product Differentiation and Oligopoly in International Markets: The Case of the U.S. Automobile Industry," *Econometrica*, 63 (4), pp. 891-951.

*Nevo, A (2000), "A Practitioner's Guide to Estimation of Random Coefficients Logit Models of Demand", *Journal of Economics & Management Strategy* 9(4), 513-548

4. Production and Cost Function Estimation

(*) Akerberg, D., C.L. Benkard, S. Berry, A. Pakes (2007). Econometric Tools for Analyzing Market Outcomes, In: James J. Heckman and Edward E. Leamer, Editor(s), *Handbook of Econometrics*, Elsevier, Volume 6, Part 1, Pages 4171-4276

(*) Akerberg, D., Caves, K., and Frazer, G. (2015). Identification properties of recent production function estimators, *Econometrica* 83(6), pp2411-2451

(*) Olley, S. and A. Pakes (1996). "The dynamics of Productivity in the Telecommunications equipment industry" *Econometrica* 64 (6), pp 1263-1297

Levinsohn, S. and A. Petrin (2003). "Estimating Production Functions using inputs to control for unobservables" *Review of Economic Studies*, 70, 317-341

Blundell, R. and S. Bond (2000). GMM estimation with persistent panel data: an application to production functions. *Econometric reviews*, 19(3), 321-340.

Bloom, N., Sadun, R., and Van Reenen, J. (2012). Americans do IT better: US multinationals and the productivity miracle. *American Economic Review*, 102(1), 167-201.

(*) Evans, D., and J. Heckman (1983). Multiproduct Cost Functions and Natural Monopoly Test for the Bell System, in *Breaking Up Bell: Essays on Industrial Organization and regulation*, ed. by D. Evans. North-Holland, Amsterdam.

5. Static Models of Entry

Berry, S. and J. Waldfogel (1999). Free Entry and Social Inefficiency in Radio Broadcasting, *Rand Journal of Economics*, 30(3), pp. 397-420.

Berry, S. (1992). Estimation of a Model of Entry in the Airline Industry, *Econometrica*, 60 (4), 889-917.

(*) Berry, S. and P. Reiss (2007). Chapter 29: Empirical Models of Entry and Market Structure, In: M. Armstrong and R. Porter, Editor(s), *Handbook of Industrial Orga-*

nization, Elsevier, 2007, Volume 3, Pages 1845-1886

(*) Bresnahan, T. and P. Reiss (1991). Entry and Competition in Concentrated Markets, *Journal of Political Economy*, 99-97

(*) Seim, K. (2006), An Empirical Model of Firm Entry with Endogenous Product-Type Choices, *RAND Journal of Economics*, 37, 619-640.

(*) Ciliberto, F., and E. Tamer. (2009). Market structure and multiple equilibria in airline markets. *Econometrica*, 77(6), 1791-1828

Pakes, A., Porter, J., Ho, K., and J. Ishii (2015). Moment inequalities and their application. *Econometrica*, 83(1), 315-334.

Sutton, J. (1991) *Sunk Costs and Market Structure: Price Competition, Advertising and the Evolution of Concentration*. MIT Press: Cambridge. Chs 1-5.

6. Empirical Models of Auctions

Paarsch H. and H. Hong (2006). *Introduction to the Structural Econometrics of Auction Data*, MIT Press.

Krishna, V. (2002). *Auction Theory*, Academic Press.

Milgrom, P. (2004). *Putting Auction Theory to Work*, Cambridge University Press

Klemperer, P. (2004). *Auctions: Theory and Practice*, Princeton University Press.

(*) S. Athey and P. Haile (2007). “Nonparametric Approaches to Auctions,” *Handbook of Econometrics*, Volume 6.

(*) E. Guerre, I. Perrigne and Q. Vuong (2007). “Optimal Nonparametric Estimation of First-Price Auctions” *Econometrica* 68, 525-574.

(*) Kastl, J. (2017, November). Recent advances in empirical analysis of financial markets: Industrial organization meets finance. In *Advances in Economics and Econometrics: Eleventh World Congress* (Vol. 2, pp. 231-270).

J.-J. Laffont, H. Ossard, and Q. Vuong (1995). “Econometrics of First Price Auctions,” *Econometrica* July, 953-980.

7. Estimation of Single Agent Dynamic Models

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

(*) Arcidiacono, P., and Miller, R. A. (2011). Conditional choice probability estimation of dynamic discrete choice models with unobserved heterogeneity. *Econometrica*, 79(6), 1823-1867.

De Groote, O. and F. Verboven (2019). Subsidies and time discounting in new technology adoption: Evidence from solar photovoltaic systems. *American Economic Review*, 109(6), 2137-72.

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

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

Rust, J. (1994), Estimation of Dynamic Structural Models: Problems and Prospects, Part I: Discrete Decision Processes, in C. Sims and J. Laffont (eds.), *Advances in Econometrics: 6th World Congress*, Volume II, Cambridge University Press.

Rust, J. (1994), Structural Estimation of Markov Decision Processes, in: *Handbook of Econometrics*, Volume IV, Edited by R.F. Engle and D.L. McFadden, Elsevier.

8. Estimation of Dynamic Games

(*) Aguirregabiria, V. and P. Mira (2007). Sequential Estimation of Dynamic Discrete Games, *Econometrica*, 75,1–53.

Aguirregabiria, V., and A. Magesan (2020). Identification and estimation of dynamic games when players beliefs are not in equilibrium. *The Review of Economic Studies*, 87(2), 582-625.

Bajari, P., Benkard, L., and J. Levin (2007). Estimating Dynamic Models of Imperfect Competition, *Econometrica*, 75, 1331–1370.

Jofre-Bonet, M., and M. Pesendorfer (2003). Estimation of a Dynamic Auction Game, *Econometrica*, 71, 1443-1489.

Pakes, A., Ostrovsky, T. and Berry, S. (2007). Simple Estimators for the Parameters of Discrete Dynamic Games (with Entry/Exit Examples), *RAND Journal of Economics*, 38(2), 373-399.

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

Pesendorfer, M. and P. Schmidt-Dengler (2010). Sequential Estimation of Dynamic Discrete Games: A Comment, *Econometrica*, 78, 833-842