

Russell Cooper
Fall 2021

Quantitative Methods and Applications: Dynamic Factor Demand

Goal

These lectures study decision problems of firms in a dynamic stochastic setting. To do so, the course will develop a number of tools and then apply them to the firms' choice problems and, in some cases, an equilibrium outcome.

A primary tool is dynamic programming. The course will build upon the basic foundations for dynamic programming, both in theory and through numerical analysis. Another tool is the use of simulated method of moments to estimate parameters of dynamic economic models. These were taught in the first year core courses and will be reviewed at the start of this course.

The main focus will be on dynamic factor demand, both capital and labor. These applications will use and further develop the tools taught in the first part of the course. In addition, policy dimensions of the applications will be developed.

Requirements

You will have a requirement to write a paper following the structure of the summer report.

Reading List

The lecture plan with a subset of relevant readings is provided below. Entries with a * will be the basis of class lecture. Notes will be posted for various sections of the course.

Material for the course will be drawn from

Jérôme Adda and Russell Cooper, *Dynamic Economics: Quantitative Methods and Applications*, MIT Press, 2003. (AC)

Class 1: Overview

- * AC, Chpt. 2, 3, 4
- Bertsekas, D. *Dynamic Programming and Stochastic Control*, New York: Academic Press, 1976.
- * Cooper, R. "Overview of Dynamic Programming ," September 2019.
- Judd, K " Review of Recursive Methods in Economic Dynamics," *Journal of Economic Literature*, 29 (1991), 69-77.
- Sargent, T. *Dynamic Macroeconomic Theory*, Cambridge, Mass.:Harvard University Press: 1987, chapter 1.
- * Stokey, N and R. Lucas, *Recursive Methods in Economic Dynamics*, Cambridge, Mass.: Harvard University Press, 1989. Chpt 3,9

Class 2–4: Firm Dynamics: Capital

- * AC, Chpt. 8

- Abel, A. and J. Eberly, "A Unified Model of Investment Under Uncertainty," *American Economic Review*, 94 (1994), 1369-84.
- Bachmann, Rüdiger, and Christian Bayer. "'Wait-and-See' business cycles?." *Journal of Monetary Economics* 60, no. 6 (2013): 704-719.
- #Buera, Francisco J., and Yongseok Shin. "Financial frictions and the persistence of history: A quantitative exploration." *Journal of Political Economy* 121, no. 2 (2013): 221-272.
- *Bloom, Nicholas. "The impact of uncertainty shocks." *Econometrica* 77, no. 3 (2009): 623-685.
- # Bloom, Nicholas, Max Floetotto, Nir Jaimovich, Itay Saporta-Eksten, and Stephen J. Terry. "Really uncertain business cycles." *Econometrica* 86, no. 3 (2018): 1031-1065.
- Caballero, R. and E. Engel, "Explaining Investment Dynamics in U.S. Manufacturing: A Generalized (S,s) Approach", *Econometrica*, 67 (1999), 783-826.
- Caballero, R., E. Engel and J. Haltiwanger, "Plant Level Adjustment and Aggregate Investment Dynamics," *Brookings Papers on Economic Activity*, 2 (1995b), 1-39.
- Cooley, Thomas F., and Vincenzo Quadrini. "Financial markets and firm dynamics." *American economic review* 91, no. 5 (2001): 1286-1310.
- Cooper, R. and J. Ejarque, "Exhuming Q: Market Power vs. Capital Market Imperfections," NBER Working Paper #8182, March 2001. (<http://papers.nber.org/papers/W8182>)
- * Cooper, R. and J. Ejarque, "Financial Frictions and Investment: A Requiem in Q," *Review of Economic Dynamics*, 6 (2003), 710-28.
- * Cooper, R. and J. Haltiwanger, "On the Nature of Capital Adjustment Costs," *Review of Economic Studies*, 73 (2006), 611-33.
- Cooper, R., J. Haltiwanger and L. Power, "Machine Replacement and the Business Cycle: Lumps and Bumps", *American Economic Review*, 89 (1999), 921-946.
- Cooper, R., J. Haltiwanger and J. Willis, "Euler Equation Estimation for Discrete-Choice Models: A Capital Accumulation Application" November 2005.
- #David, Joel M., Hugo A. Hopenhayn, and Venky Venkateswaran. "Information, misallocation, and aggregate productivity." *The Quarterly Journal of Economics* 131, no. 2 (2016): 943-1005.
- #David, Joel M., and Venky Venkateswaran. "The sources of capital misallocation." *American Economic Review* 109, no. 7 (2019): 2531-67.
- # Gilchrist, Simon, and Egon Zakrajšek. "Credit spreads and business cycle fluctuations." *American Economic Review* 102, no. 4 (2012): 1692-1720.
- # Gomes, Joao F. "Financing investment." *American Economic Review* 91, no. 5 (2001): 1263-1285.
- #Khan, Aubhik, and Julia K. Thomas. "Idiosyncratic shocks and the role of nonconvexities in plant and aggregate investment dynamics." *Econometrica* 76, no. 2 (2008): 395-436.
- *Thomas, J. "Is Lumpy Investment Relevant for the Business Cycle?" *Journal of Political Economy* 110, no. 3 (2002): 508-534.

Class 5-6: Firm Dynamics: Labor

- *AC, Chpt. 9
- Caballero, R. and E. Engel, "Microeconomic Adjustment Hazards and Aggregate Dynamics", *Quarterly Journal of Economics*, 108 (1993), 313-58.
- Caballero, R., E. Engel and J. Haltiwanger, "Aggregate Employment Dynamics: Building from Microeconomic Evidence", *American Economic Review*, 87 (1997), 115-137.
- Cooper, Russell, and Jonathan L. Willis. "A comment on the economics of labor adjustment: Mind the gap." *American Economic Review* (2004): 1223-1237.
- * Cooper, R., Gong, G and P. Yan, "Costly Labor Adjustment: General Equilibrium Effects of China's Employment Regulations and Financial Reforms", *Economic Journal* (2017): 1879- 1922.
- #Hopenhayn, Hugo, and Richard Rogerson. "Job turnover and policy evaluation: A general equilibrium analysis." *Journal of political Economy* 101, no. 5 (1993): 915-938.
- #Hsieh, Chang-Tai, and Peter J. Klenow. "Misallocation and manufacturing TFP in China and India." *The Quarterly Journal of Economics* 124, no. 4 (2009): 1403-1448.

Class 7: Labor Search

- *Cooper, R. and J. Haltiwanger and J. Willis, "Search frictions: Matching aggregate and establishment observations" *Journal of Monetary Economics* (2007), 56-78.
- #Menzio, Guido, and Shouyong Shi. "Directed search on the job, heterogeneity, and aggregate fluctuations." *The American Economic Review* (2010): 327-332.
- #Shimer, R. "The Cyclical Behavior of Equilibrium Unemployment and Vacancies" *The American Economic Review* (2005): 25-49.
- *Wolpin, K. "Estimating a structural search model: the transition from school to work." *Econometrica* (1987), 801-817.