

Economics 861.01
Monetary Theory I
Syllabus
Professor Sanjay Chugh
Spring 2012

Meetings: Wednesdays 12:00pm-1:15pm, Room 480P
Thursdays, 12:00pm-1:15pm, Room 429

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Matlab Sessions: **Led by Jonathan Hoddenbagh**

Prerequisites: The first-year economics Ph.D. sequence (in particular, EC750.01 and 751.01). Auditors and other upper-level students welcome, but are expected to actively participate in both class discussion and assignments.

Grading: The final course grade will be based on:

1. Completing a “computational primer:” solving computationally for the deterministic steady state of a few versions of the basic RBC model – **7.5% of final grade.**
2. Computationally solving and simulating the basic RBC model, tabulating business cycle statistics, etc. (written as a complete, stand-alone paper) – **20% of final grade.**
3. Two or three other computational projects to be assigned during the course, tabulating business cycle statistics, etc. (each written as a complete, stand-alone paper) – **40% of final grade.**
4. In-class presentation of a paper (from a designated set of papers) – **17.5% of final grade.**
5. Assorted assignments, short writing pieces, quizzes, etc – **15% of final grade.**

Reference Texts: Some “all-purpose” macroeconomics and monetary economics texts that are likely to be useful to have on your shelf:

1. *Frontiers of Business Cycle Research*, 1995. Edited by Thomas F. Cooley. Princeton University Press.
2. *Monetary Theory and Policy*, 3rd edition, 2010. By Carl Walsh. MIT Press.
3. *Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework*, 2008. By Jordi Gali. Princeton University Press.
4. *Equilibrium Unemployment Theory*, 2nd edition, 2000. By Christopher A. Pissarides. MIT Press.
5. *Labor Markets and Business Cycles*, 2010. By Robert Shimer. Princeton University Press.

6. *Interest and Prices: Foundations of a Theory of Monetary Policy*, 1st edition, 2003. By Michael Woodford. Princeton University Press.
7. *Recursive Macroeconomic Theory*, 2nd edition, 2004. By Lars Ljungqvist and Thomas J. Sargent. MIT Press.
8. *Recursive Methods in Economic Dynamics*, 1989. By Nancy L. Stokey and Robert E. Lucas, Jr., with Edward C. Prescott. Harvard University Press.

Objectives: There are three main objectives for the course.

1. First, the course will trace through some seminal branches of macroeconomic theory over the past 30 years. Most of the emphasis will be on business cycle modeling and policy issues, which were the proximate causes of the revolution in macroeconomics 30 years ago. We will trace these arcs of thought through to modern quantitative partial equilibrium and general equilibrium business cycle models and policy analysis and identify/examine where some of the current research frontiers lie.
2. A second fundamental objective is to get started on computational solutions of partial equilibrium and general equilibrium business cycle models. Beyond the simplest of models, modern macroeconomics is computationally intensive. We will study basic tools that macroeconomists typically use to approximate and solve business cycle models. This means “rolling up your sleeves” and learning (if you do not know already) some basic programming and computing techniques. Our laboratory for developing computational techniques will first be the baseline RBC model, and then we will progress to models that introduce various departures from the baseline competitive RBC model.
3. Third, a necessary condition to be a successful economist (not just a successful macroeconomist) is effective communication skills, both written and spoken. It is never too early to begin (or continue) developing such skills. I will insist that all assignments/projects be written as if they were small “papers,” with a clear motivation laid out at the outset, a clear presentation of the model(s) used, a clear description of the methodology employed, effective presentation of and discussion of results, and so on. The required in-class presentation of a paper (from among the set of papers designated as “student presentation” below) also fosters this objective.

In all written submissions of papers, the following should be completely clear after the abstract and the first two paragraphs of your paper: the basic question your paper/project addresses; the big-picture answer(s) your paper provides; why this ought to be of interest to macroeconomists; and (related) how/along what dimensions your work advances the relevant field of knowledge. If, after reading the first two paragraphs of your submission, I judge that you have not clearly explained these basics, your paper will be returned to you ungraded for you to improve and resubmit.

Outline of Topics: The following is a sketch of topics we will cover this semester – it may be modified, depending on time constraints and student and professor interest, as the course progresses.

1. A (Brief and Partial) History of Macroeconomics and the Evolving Agenda

1. **(Required)** Prescott, Edward C. 2006. “Nobel Lecture: The Transformation of Macroeconomic Policy and Research.” *Journal of Political Economy*, Vol. 114, pp. 203-235.
2. **(Required)** Mankiw, N. Gregory. 2006. “The Macroeconomist as Scientist and Engineer.” *Journal of Economic Perspectives*, Vol. 20, pp. 29-46.
3. **(Required)** Ohanian, Lee E. 2010. “The Economic Crisis from a Neoclassical Perspective.” *Journal of Economic Perspectives*, Vol. 24, Fall 2010, p. 45-66.
4. Blanchard, Olivier J. 2008. “The State of Macro.” NBER Working Paper No. 14259.
5. Akerlof, George A. 2007. “The Missing Motivation in Macroeconomics.” *American Economic Review*, Vol. 97, pp. 5-36.
6. Kydland, Finn E. 2006. “Nobel Lecture: Quantitative Aggregate Economics.” *American Economic Review*, Vol. 96, pp. 1373-1383.
7. Lucas, Robert E. 1995. “Monetary Neutrality.” Nobel Lecture.
8. Solow, Robert M. 1987. “Growth Theory and After.” Nobel Lecture
9. Chari, V.V. and Patrick J. Kehoe. 2006. “Modern Macroeconomics in Practice: How Theory is Shaping Policy.” *Journal of Economic Perspectives*, Vol. 20, pp. 3-28.
10. Rebelo, Sergio T. 2005. “Real Business Cycle Models: Past, Present, and Future.” NBER Working Paper No. 11401.
11. Hall, Robert E. 2010. “Why Does the Economy Fall to Pieces After a Financial Crisis?” *Journal of Economic Perspectives*, Vol. 24, Fall 2010, p. 3-20.
12. Woodford, Michael. 2010. “Financial Intermediation and Macroeconomic Analysis.” *Journal of Economic Perspectives*, Vol. 24, Fall 2010, p. 21-44.
13. Fuster, Andreas, David Laibson, and Brock Mendel. 2010. “Natural Expectations and Macroeconomic Fluctuations.” *Journal of Economic Perspectives*, Vol. 24, Fall 2010, p. 67-84.

14. Caballeo, Ricardo. 2010. “Macroeconomics after the Crisis: Time to Deal with the Pretense-of-Knowledge Syndrome.” *Journal of Economic Perspectives*, Vol. 24, Fall 2010, p. 85-102.

2. Review of Dynamic Stochastic General Equilibrium (DSGE) Theory

15. **(Required)** King, Robert G. and Sergio T. Rebelo. 1999. “Resuscitating Real Business Cycles.” In *Handbook of Macroeconomics*, Vol. 1B, edited by John B. Taylor and Michael Woodford.
16. Campbell, John Y. 1994. “Inspecting the Mechanism: An Analytical Approach to the Stochastic Growth Model.” *Journal of Monetary Economics*, Vol. 33, pp. 463-506.
17. Ingram, Beth F., Narayana R. Kocherlakota, and N.E. Savin. 1994. “Explaining Business Cycles: A Multiple-Shock Approach.” *Journal of Monetary Economics*, Vol. 34, pp. 415-428.
18. McGrattan, Ellen R. 2006. “Real Business Cycles.” Federal Reserve Bank of Minneapolis Staff Report No. 370.

3. Basics of Dynamic Programming

19. **(Required)** Prescott, Edward C. and Rajnish Mehra. 1980. “Recursive Competitive Equilibrium: The Case of Homogeneous Households.” *Econometrica*, Vol. 48, p. 1365-1379.
20. Ljungqvist and Sargent text, Chapter 1.4, Chapter 2.2, Chapter 3, 4, 5
21. Stokey, Lucas, and Prescott textbook

4. Basic Computational Methods and Calibration

22. **(Required)** Schmitt-Grohe, Stephanie and Martin Uribe. 2004. “Solving Dynamic General Equilibrium Models Using a Second-Order Approximation to the Policy Function.” *Journal of Economic Dynamics and Control*, Vol. 28, pp. 755-775.
23. Uhlig, Harald. 1999. “A Toolkit for Analyzing Nonlinear Dynamic Stochastic Models Easily.” In *Computational Methods for the Study of Dynamic Economies*, edited by Ramon Marimon and Andrew Scott. Oxford Press.

5. Quantitative Macroeconomic Models I: Early Labor and Monetary Analysis

24. **(Required)** Rogerson, Richard. 1988. “Indivisible Labor, Lotteries and Equilibrium.” *Journal of Monetary Economics*, Vol. 21, pp. 3-16.
25. **(Required)** Hansen, Gary D. 1985. “Indivisible Labor and the Business Cycle.” *Journal of Monetary Economics*, Vol. 16, pp. 309-327.
26. **(Required)** Cooley, Thomas F. and Gary D. Hansen. 1989. “The Inflation Tax in a Real Business Cycle Model.” *American Economic Review*, Vol. 79, pp. 733-748.
27. **(Required)** Cooley, Thomas F. and Gary D. Hansen. 1991. “The Welfare Costs of Moderate Inflation.” *Journal of Money, Credit, and Banking*, Vol. 23, pp. 483-503.
28. Cho, Jang-Ok and Thomas F. Cooley. 1994. “Employment and Hours Over the Business Cycle.” *Journal of Economic Dynamics and Control*, Vol. 18, pp. 411-432.
29. Cooley, Thomas F. and Gary D. Hansen. 1995. “Money and the Business Cycle.” In *Frontiers of Business Cycle Research*, edited by Thomas F. Cooley. Princeton University Press.

6. Quantitative Macroeconomic Models II: Monopoly and Sticky Price Models

30. **(Required)** Rotemberg, Julio J. and Michael Woodford. 1995. “Dynamic General Equilibrium Models with Imperfectly Competitive Product Markets.” In *Frontiers of Business Cycle Research*, edited by Thomas F. Cooley. Princeton University Press.
31. **(Required)** Calvo, Guillermo A. 1983. “Staggered Prices in a Utility-Maximizing Framework.” *Journal of Monetary Economics*, Vol. 12, pp. 383-398.
32. **(Required)** Yun, Tack. 1996. “Nominal Price Rigidity, Money Supply Endogeneity, and Business Cycles.” *Journal of Monetary Economics*, Vol. 37, pp. 345-370.
33. Dixit, Avinash K. and Joseph E. Stiglitz. 1977. “Monopolistic Competition and Optimum Product Diversity.” *American Economic Review*, Vol. 67, pp. 297-308.
34. Blanchard, Olivier J. and Nobuhiro Kiyotaki. 1987. “Monopolistic Competition and the Effects of Aggregate Demand.” *American Economic Review*, Vol. 77, pp. 647-666.
35. Kimball, Miles S. 1995. “The Quantitative Analytics of the Basic Neomonetarist Model.” *Journal of Money, Credit, and Banking*, Vol. 27, pp. 1241-1277.

36. Chari, V.V., Patrick J. Kehoe, and Ellen R. McGrattan. 2000. "Sticky Price Models of the Business Cycle: Can the Contract Multiplier Solve the Persistence Problem?" *Econometrica*, Vol. 68, pp. 1151-1179.
37. Mankiw, N. Gregory. 1985. "Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly." *Quarterly Journal of Economics*, Vol. 100, pp. 529-538.
38. Taylor, John B. 1980. "Aggregate Dynamics and Staggered Contracts." *Journal of Political Economy*, Vol. 88, pp. 1-23.
39. Rotemberg, Julio J. 1982. "Sticky Prices in the United States." *Journal of Political Economy*, Vol. 90, pp. 1187-1211.
40. Roberts, John M. 1995. "New Keynesian Economics and the Phillips Curve." *Journal of Money, Credit, and Banking*, Vol. 27, pp. 975-984.
41. Rotemberg, Julio J. and Michael Woodford. 1998. "An Optimization-Based Econometric Framework for the Evaluation of Monetary Policy: Expanded Version." NBER Technical Working Paper 233.
42. Taylor, John B. 1999. "Staggered Price and Wage Setting in Macroeconomics." In *Handbook of Macroeconomics*, Vol. 1B, edited by John B. Taylor and Michael Woodford.
43. Basu, Susanto and John G. Fernald. 1997. "Returns to Scale in U.S. Production: Estimates and Implications." *Journal of Political Economy*, Vol. 105, pp. 249-283.
44. Sbordone, Argia M. 2002. "Price and Unit Labor Costs: A New Test of Price Stickiness." *Journal of Monetary Economics*, Vol. 49, pp. 265-292.
45. **(Student Presentation)** Bills, Mark and Peter J. Klenow. 2004. "Some Evidence on the Importance of Sticky Prices." *Journal of Political Economy*, Vol. 112, pp. 947-985.

7. Quantitative Macroeconomic Models III: Unemployment

46. **(Student Presentation)** Rogerson, Richard and Robert Shimer. 2011. "Search in Macroeconomic Models of the Labor Market." *Handbook of Labor Economics*, Elsevier.
47. **(Required)** Rogerson, Richard, Robert Shimer, and Randall Wright. 2005. "Search-Theoretic Models of the Labor Market: A Survey." *Journal of Economic Literature*, Vol. 43, pp. 959-988.

48. **(Required)** Shimer, Robert. 2005. “The Cyclical Behavior of Equilibrium Unemployment and Vacancies.” *American Economic Review*, Vol. 95, pp. 25-49.
49. **(Required)** Hall, Robert E. 2005. “Equilibrium Wage Stickiness.” *American Economic Review*, Vol. 95, pp. 50-65.
50. **(Required)** Andolfatto, David. 1996. “Business Cycles and Labor Market Search.” *American Economic Review*, Vol. 86, pp. 112-132.
51. **(Required)** denHaan, Wouter J., Garey Ramey, and Joel Watson. 2000. “Job Destruction and Propagation of Shocks.” *American Economic Review*, Vol. 90, pp. 482-498.
52. **(Required)** Pissarides, Christopher A. 2009. “The Unemployment Volatility Puzzle: Is Wage Stickiness the Answer?” *Econometrica*, Vol. 77, p. 1339-1369.
53. Merz, Monika. 1995. “Search in the Labor Market and the Real Business Cycle.” *Journal of Monetary Economics*, Vol. 36, pp. 269-300.
54. Gertler, Mark and Antonella Trigari. 2009. “Unemployment Fluctuations with Staggered Nash Bargaining.” *Journal of Political Economy*, Vol. 117, p. 38-86.
55. **(Required)** Hagedorn, Marcus and Iourii Manovskii. 2008. “The Cyclical Behavior of Equilibrium Unemployment and Vacancies Revisited.” *American Economic Review*, Vol. 98, p. 1692-1706.
56. **(Required)** Hosios, Arthur J. 1990. “On the Efficiency of Matching and Related Models of Search and Unemployment.” *Review of Economic Studies*, Vol. 57, p. 279-298.
57. **(Required)** Moen, Espen. 1997. “Competitive Search Equilibrium.” *Journal of Political Economy*, Vol. 105, pp. 385-411.
58. Veracierto, Marcelo. 2008. “On the Cyclical Behavior of Employment, Unemployment, and Labor Force Participation.” *Journal of Monetary Economics*, Vol. 55, pp. 1143-1157.
59. Pissarides, Christopher A. 2000. *Equilibrium Unemployment Theory*. MIT Press.

8. Quantitative Macroeconomic Models IV: Medium-Scale Models

60. Christiano, Lawrence J., Martin Eichenbaum, and Charles L. Evans. 2005. “Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy.” *Journal of Political Economy*, Vol. 113, pp. 1-45.

61. Chari, V.V., Patrick J. Kehoe, and Ellen R. McGrattan. 2007. "Business Cycle Accounting." *Econometrica*, Vol. 75, pp. 781-836.
62. **(Student Presentation)** Comin, Diego and Mark Gertler. 2006. "Medium-Term Business Cycles." *American Economic Review*, Vol. 96, pp. 523-551.
63. **(Student Presentation)** Jones, Charles I. and Paul M. Romer. 2010. "The New Kaldor Facts: Ideas, Institutions, Population, and Human Capital." *American Economic Journal: Macroeconomics*, Vol. 2, pp. 224-245.

9. Optimal Policy I: The New Keynesian Approach

64. **(Required)** Gali, Jordi and Mark Gertler. 2007. "Macroeconomic Modeling for Monetary Policy Evaluation." *Journal of Economic Perspectives*, Vol. 21, pp. 25-45.
65. **(Required)** King, Robert G. and Alexander L. Wolman. 1999. "What Should the Monetary Authority Do When Prices Are Sticky?" In *Monetary Policy Rules*, edited by John B. Taylor. NBER Conference Volume on Research in Business.
66. **(Required)** Erceg, Christopher J., Dale W. Henderson, and Andrew Levin. 2000. "Optimal Monetary Policy with Staggered Wage and Price Contracts." *Journal of Monetary Economics*, Vol. 46, pp. 281-313.
67. Clarida, Richard, Jordi Gali, and Mark Gertler. 1999. "The Science of Monetary Policy: A New Keynesian Perspective." *Journal of Economic Literature*, Vol. 37, pp. 1661-1707.
68. Goodfriend, Marvin and Robert G. King. 2001. "The Case for Price Stability." NBER Working Paper No. 8423.
69. Chari, V.V., Patrick J. Kehoe, and Ellen R. McGrattan. 2009. "The New Keynesian Model is Not Yet Ready for Policy Analysis." *AEJ: Macroeconomics*, Vol. 1, p. 242-266.
70. Atkeson, Andrew and Patrick J. Kehoe. 2009. "On the Need for a New Approach to Analyzing Monetary Policy." *NBER Macroeconomics Annual 2008*.
71. Woodford, Michael. 2003. *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton University Press.

10. Optimal Policy II: The Ramsey Approach

72. **(Required)** Schmitt-Grohe, Stephanie and Martin Uribe. 2010. “The Optimal Rate of Inflation.” NBER Working Paper 16054 (forthcoming in *Handbook of Monetary Economics*).
73. Ramsey, Frank. 1927. “A Contribution to the Theory of Taxation.” *Economic Journal*, Vol. 37, pp. 47-61.
74. Phelps, Edmund. 1973. “Inflation in the Theory of Public Finance.” *Swedish Journal of Economics*, Vol. 75, pp. 67-82.
75. Lucas, Robert E. and Nancy L. Stokey. 1983. “Optimal Fiscal and Monetary Policy in an Economy Without Capital.” *Journal of Monetary Economics*, Vol. 12, pp. 55-93.
76. **(Required)** Chamley, Christophe. 1986. “The Welfare Cost of Capital Income Taxation in a Growing Economy.” *Econometrica*, Vol. 54, pp. 607-622.
77. **(Required)** Chari, V.V., Lawrence J. Christiano, and Patrick Kehoe. 1991. “Optimal Fiscal and Monetary Policy: Some Recent Results.” *Journal of Money, Credit, and Banking*, Vol. 23, pp. 519-539.
78. Chari, V.V. and Patrick J. Kehoe. 1999. “Optimal Fiscal and Monetary Policy.” In *Handbook of Macroeconomics*, Vol. 1C, edited by John B. Taylor and Michael Woodford.
79. Calvo, Guillermo and Pablo E. Guidotti. 1993. “On the Flexibility of Monetary Policy: The Case of the Optimal Inflation Tax.” *Review of Economic Studies*, Vol. 60, pp. 667-687.
80. Schmitt-Grohe, Stephanie and Martin Uribe. 2004. “Optimal Fiscal and Monetary Policy Under Imperfect Competition.” *Journal of Macroeconomics*, Vol. 26, pp. 183-209.
81. Schmitt-Grohe, Stephanie and Martin Uribe. 2004. “Optimal Fiscal and Monetary Policy Under Sticky Prices.” *Journal of Economic Theory*, Vol. 114, pp. 198-230.
82. Siu, Henry E. 2004. “Optimal Fiscal and Monetary Policy with Sticky Prices.” *Journal of Monetary Economics*, Vol. 51, pp. 576-607.
83. **(Required)** Chugh, Sanjay K. 2006. “Optimal Fiscal and Monetary Policy with Sticky Wages and Sticky Prices.” *Review of Economic Dynamics*, Vol. 9, pp. 683-714.

84. Chugh, Sanjay K. 2007. “Optimal Inflation Persistence: Ramsey Taxation with Capital and Habits.” *Journal of Monetary Economics*, Vol. 54, pp. 1809-1836.
85. Aruoba, S. Boragan and Sanjay K. Chugh. 2010. “Optimal Fiscal and Monetary Policy when Money is Essential.” *Journal of Economic Theory*, Vol. 145, pp. 1618-1647.
86. **(Required)** Arseneau, David M. and Sanjay K. Chugh. 2008. “Optimal Fiscal and Monetary Policy with Costly Wage Bargaining.” *Journal of Monetary Economics*, Vol. 55, p. 1401-1414.
87. **(Required)** Arseneau, David M. and Sanjay K. Chugh. 2010. “Tax Smoothing in Frictional Labor Markets.” University of Maryland.

11. Monetary Policy and Unemployment

88. **(Required)** Gali, Jordi. 2010. “Monetary Policy and Unemployment.” NBER Working Paper 15871 (forthcoming in *Handbook of Monetary Economics*).
89. **(Required)** Blanchard, Olivier and Jordi Gali. 2010. “Labor Markets and Monetary Policy: A New Keynesian Model with Unemployment.” *American Economic Journals: Macroeconomics*, Vol. 2, p. 1-30.
90. **(Required)** Ravenna, Federico and Carl Walsh. 2011. “Welfare-Based Optimal Monetary Policy with Unemployment and Sticky Prices: A Linear-Quadratic Framework.” *American Economic Journals: Macroeconomics*, Vol. 3, p. 130-162.

12. Risk Shocks in Business Cycle Analysis

91. Fernandez-Villaverde, Jesus, Pablo Guerron, Juan Rubio-Ramirez, and Martin Uribe. 2010. “Risk Matters: The Real Effects of Volatility Shocks.” Forthcoming in *American Economic Review*.
92. Bachmann, Ruediger and Christian Bayer. 2009. “Firm-Specific Productivity Risk over the Business Cycle: Facts and Aggregate Implications.” University of Michigan.
93. Bloom, Nicholas, Max Floetotto, and Nir Jaimovich. 2010. “Really Uncertain Business Cycles.” Stanford University.
94. Chugh, Sanjay K. 2011. “Firm Risk and Leverage-Based Business Cycles.” University of Maryland.