Macroeconomics
411-1
Fall, 2011
Christiano

Syllabus

1. General Information.

   - Lectures are T-Th, 1-3PM, Anderson Hall, 3245. Discussion section: Friday 11 - 12.50pm, in the lecture room.
   - My office number is 3246, Andersen Hall; Phone: 491-8231. Email: l-christiano@northwestern.edu. Office hours: Teusday, 3-4:30pm.
   - Teaching Assistant: Roland Eisenhuth. Office hours, 1-2:30 Friday, TA room; email, eisenhuth@northwestern.edu.
   - The grades will be determined as follows: homeworks, 10%; midterm, 40%; final, 50%. There will be weekly homework assignments. You are requested to work in teams of up to four students on these problem sets, and only one should be submitted per group. Homeworks should be turned in to the Economics Department office by Wednesday, 5pm, in the week after they are assigned.
   - The midterm is on Thursday, November 10, in the lecture room. The final is on Teusday, December 6, 3-5pm, in the regular lecture room.

2. Goals.

   Macroeconomics is about: (i) developing positive models that can help us understand the dynamics of key macroeconomic variables: employment, unemployment, interest rates, output, etc.; and (ii) using these models to make judgements about whether allocations are efficient and, if not, what policy interventions might improve things.

   To address (i), we will begin by developing the basic building block of modern macroeconomics: the infinite lived, deterministic, homogeneous agent growth model. One set of variations of this model will allow us to review a subset of the modern theory of growth. Other variations will allow us to review several approaches to the integration of financial frictions into macroeconomics. We may also be able to consider models of monetary economies. To address (ii) we will, time permitting, review some elements of Ramsey-optimal policy.

- The textbooks for the course are S-L and L-S:

  Nancy L. Stokey and Robert E. Lucas, Jr., with Edward C. Prescott, *Recursive Methods in Economic Dynamics*, Harvard University Press, 1989.

  Ljungqvist and Sargent's, *Recursive Macroeconomic Theory*, 2nd Edition, MIT Press, 2004.

- Additional reading materials will be made available on the course website.

COURSE OUTLINE

There will be 19 lectures (one of these is taken by the midterm). The topics are summarized below, with the rough number of lectures expected to be devoted to each given in parentheses. The primary and related readings for each lecture are listed. (Many of the related readings may be found on the course website, which can be found by going to my web page.)

1. Infinite Horizon Model With No Uncertainty and Fixed Labor.
   - (a) (four lectures) Efficient Allocations.
     - i. Sequence Approach (S-L: pp. 8-13, sec. 4.5).
     - ii. Function Space and Dynamic Programming (S-L; pp. 13-16, sec. 4.2, sec. 6.1).
   - (b) Equilibrium Concepts (S-L: sec. 2.3; L-S: chap. 6, 7; Cooley-Prescott, 1995, pp. 8-10).
     - i. Sequence concepts:
       - A. Date 0 Arrow-Debreu.
       - B. Sequence-of-Markets.
     - ii. Recursive Competitive Equilibrium.
   - (c) Application of Recursive Methods: Participation Constraints (class handout, Kehoe and Perri, Alvarez and Jermann (2000, 2001), Bodenstein (2005), Kehoe and Levin (1993), Kehoe and Perri (1992), Kocherlakota (1996), Lochner and Monge (2002), Marcet and Marimon (1992, 1999), Ljungqvist and Sargent (2004, chapter 20)).
   - (d) Application: Growth Theory (L-S, chap11; Jones and Manuelli, 1997).
     - i. Exogenous growth models.
       - A. Growth generated by 'disembodied' technical change (S-L, sec. 5.4; related paper: Christiano (1989)).
       - B. Growth generated by investment-specific technical change (Greenwood, Hercowitz and Krusell, 1997, Hornstein and Krusell, 1996).

ii. Endogenous growth models.

A. "Ak" models (Christiano and Harrison (1999, Appendix); see also: Rebelo (1991)).

B. Learning-by-doing and learning-or-doing (S-L; sec. 5.7).

C. Increasing variety and specialization (Romer, 1987; Matsuyama, 1999; class notes on Matsuyama).

iii. Reasons that Growth Might Not Happen, Even if the Technology is 'Right'

A. Overlapping-generations example (Jones and Manuelli, 1997).

B. Vested Interests (Herrendorf and Teixeira, (2003), Parente and Prescott (1994, 1999), Krusell and Rios-Rull (1996)).

2. (two lectures) Adding Uncertainty and Variable Labor: the Real Business Cycle (RBC) Model.

   (a) Business Cycle Implications (Cooley and Prescott (1995); see also: Prescott (1986), Summers (1986), Boldrin, Christiano and Fisher (2001)).

   (b) RBC model with multiple equilibria and sunspot equilibria (see: Christiano and Harrison (1999), Shleifer (1983), class notes on Shleifer; related readings: Bryant (1981,1983), Cass and Shell (1983); Cooper and John (1988); Diamond and Dybvig (1983); Diamond (1982); Farmer (1993); Farmer and Guo (1994,1995); Farmer and Woodford (1984); Gali (1994a,b); Krugman (1991); Woodford (1986,1991)).

3. (two lectures) Introducing financial frictions into macroeconomic models (see class handouts on Carlstom-Fuerst, Bernanke-Gertler-Gilchrist, Gertler-Kiyotaki, Christiano-Trabandt-Walentin).

4. (two lectures) Optimal Policy

   (a) The case of full commitment, (Chari (1988); see also Chari, Christiano and Kehoe (1994); Lucas and Stokey (1983)).

(b) The case of no commitment (the ‘time inconsistency problem’) (Chari (1988) and Christiano and Fitzgerald (2002); see also: Chari, Christiano and Eichenbaum (1996); Albanesi, Chari, and Christiano, (2002a,b), Chari and Kehoe (1980); Kydland and Prescott (1977); Stokey (1991)).

References

[1] Alvarez, Fernando and Urban Jermann, 2000, 'Efficiency, Equilibrium, and Asset Pricing with Risk of Default,' *Econometrica*, vol. 68, pp. 775-797.

[2] Alvarez, Fernando and Urban Jermann, 2001, 'Quantitative Asset Pricing Implications of Endogenous Solvency Constraints,' *Review of Financial Studies*, vol. 14, pp. 1117-1151.

[3] Azariadis, Costas, 1981, 'Self-Fulfilling Prophesies,' *Journal of Economic Theory*, 25, pp. 380-396.

[4] Bodenstein, Martin, 2005, 'International Asset Markets and Real Exchange Rate Volatility,' mimeo, Northwestern University.

[5] Benhabib, Jess, and Roger E. A. Farmer, 1994, 'Indeterminacy and Growth,' *Journal of Economic Theory* 63, pp. 19-41.

[6] Benhabib, Jess, and Roger E. A. Farmer, 1995, 'Indeterminacy and Sector-Specific Externalities,' manuscript, department of economics, UCLA, May.

[7] Benhabib, Jess, and Roberto Perli, 1994, 'Uniqueness and Indeterminacy: On the Dynamics of Endogenous Growth,' *Journal of Economic Theory*, 63, pp. 113-142.

[8] Boldrin, Michele, L. J. Christiano, and Jonas Fisher, 2001, 'Asset Pricing Lessons for Modeling Business Cycles,' *American Economic Review.*

[9] Bryant, John, 1981, 'Bank Collapse and Depression,' *Journal of Money, Credit and Banking*, XIII, pp. 454-464.

[10] Bryant, John, 1983, 'A Simple Rational Expectations Keynes-Type Model,' *Quarterly Journal of Economics*, Vol. XCVIII, no. 3.

[11] Cass, David, and Karl Shell, 1983, 'Do Sunspots Matter?', *Journal of Political Economy* 91, 193-227.

[12] Chari, V.V., 1988, 'Time Consistency and Optimal Policy Design,' Federal Reserve Bank of Minneapolis *Quarterly Review*, Fall.

[13] Chari, V.V., and Patrick J. Kehoe, 1990, 'Sustainable Plans,' *Journal of Political Economy*, vol. 98, no. 4, pp. 783-802.

[14] Chari, V.V., Lawrence J. Christiano, and Martin Eichenbaum, 1998, 'Expectation Traps and Discretion,' *Journal of Economic Theory.*

[15] Chari, V.V., Lawrence J. Christiano and Patrick Kehoe, 1994, 'Policy Analysis in Business Cycle Models,' in Thomas F. Cooley, editor, *Frontiers of Business Cycle Research*, Princeton University Press.

[16] Christiano, Lawrence J., 1989, 'Understanding Japan's Saving Rate: The Reconstruction Hypothesis,' Federal Reserve Bank of Minneapolis *Quarterly Review*, Spring.

[17] Christiano, Lawrence J., and Terry Fitzgerald, 2002, 'Inflation', manuscript.

[18] Christiano, Lawrence J., and Sharon Harrison, 1999, 'Chaos, Sunspots and Automatic Stabilizers,' *Journal of Monetary Economics.*

[19] Cooley, Thomas F. and Edward C. Prescott, 1995, 'Economic Growth and Business Cycles,' in Thomas F. Cooley, editor, *Frontiers of Business Cycle Research*, Princeton University Press.

[20] Cooper, Russell, and Andrew John, 1988, 'Coordinating Coordination Failures in Keynesian Models,' *Quarterly Journal of Economics*, 103, August, pp. 441-463.

[21] Diamond, Douglas, and Philip Dybvig, 1983, 'Bank Runs, Deposit Insurance, and Liquidity,' *Journal of Political Economy* 91, 3, pp. 401-419.

[22] Diamond, Peter, 1982, 'Aggregate-Demand Management in Search Equilibrium,' *Journal of Political Economy*, 90, no. 5, pp. 881-894.

[23] Farmer, Roger E. A., 1993, *The Macroeconomics of Self-Fulfilling Prophecies*, MIT Press.

[24] Farmer, Roger E. A., and Guo, J.-T., 1994, 'Real Business Cycles and the Animal Spirits Hypothesis,' *Journal of Economic Theory* 63, pp. 42-73.

[25] Farmer, Roger E. A., and Guo, J.-T., 1995, 'The Econometrics of Indeterminacy: an Applied Study,' *Journal of Monetary Economics*.

[26] Farmer, Roger E. A., and Michael Woodford, 1984, 'Self-Fulfilling Prophecies and the Business Cycle,' Center for Analytic Research in Economics and Social Science, Working Paper no. 84-12, University of Pennsylvania, April.

[27] Gali, Jordi, 1994a, 'Monopolistic Competition, Business Cycles, and the Composition of Aggregate Demand,' *Journal of Economic Theory* 63, pp. 73-96.

[28] Gali, Jordi, 1994b, 'Monopolistic Competition, Endogenous Markups and Growth,' *European Economic Review* 38, pp. 748-756.

[29] Heaton, John, and Debbie Lucas, 1996, 'Evaluating the Effects of Incomplete Markets on Risk-Sharing and Asset Pricing,' *Journal of Political Economy* 104, pp. 443-487.

[30] Herrendorf, Berthold and Arilton Teixeira, 2003, 'Monopoly Rights Can Reduce Income Big Time,' manuscript.

[31] Hornstein, Andreas and Per Krusell, 1996, 'Can Technology Improvements Cause Productivity Slowdowns?', Macroeconomics Annual.

[32] Jones, Larry, and Rodolfo Manuelli, 1997, 'The Sources of Growth', Journal of Economic Dynamics and Control, vol. 21, no. 1.

[33] Kehoe, Timothy, and David Levine, 1993, 'Debt Constrained Asset Markets,' *Review of Economic Studies* vol. 60, pp. 865-888.

[34] Kehoe, Patrick, and Fabrizzio Perri, 2002, International Business Cycles with Endogenous Incomplete Markets, *Econometrica* vol. 70, pp. 907-928.

[35] Kocherlakota, Narayana, 1996, Implications of Efficient Risk Sharing Without Commitment, *Review of Economic Studies*, vol. 63, pp. 595-609.

[36] Krusell, Per, and Jose-Victor Rios-Rull, Vested Interests in a Positive Theory of Stagnation and Growth, *The Review of Economic Studies*, vol. 63, no. 2, 301-329.

[37] Greenwood, Jeremy, Zvi Hercowitz and Per Krusell, 1997, 'Long-Run Implications of Investment-Specific Technological Change,' working paper, Rochester Center for Economic Research, *American Economic Review.*

[38] Krugman, Paul, 1991, 'History Versus Expectations,' *Quarterly Journal of Economics*, vol. CVI, no. 2, pp. 651-667.

[39] Kydland, Finn, and Edward C. Prescott, 1977, 'Rules Rather than Discretion: The Inconsistency of Optimal Plans,' *Journal of Political Economy*, vol. 85, pp. 473-491.

[40] Lochner, Lance, and Alexander Monge-Naranjo, 2002, 'Human Capital Formation and Endogenous Credit Constraints,' unpublished manuscript, Northwestern University.

[41] Ljungqvist, Lars, and Thomas Sargent, 2004, *Recursive Macroeconomic Theory*, 2^{nd} edition, MIT Press.

[42] Lucas, Robert E., Jr., and Nancy L. Stokey, 1983, 'Optimal Fiscal and Monetary Policy in an Economy Without Capital,' *Journal of Monetary Economics*, vol. 12, pp. 55-93.

[43] Marcet, Albert and Ramon Marimon, 1992, 'Communication, Commitment and Growth,' *Journal of Economic Theory* 58, no. 2, pp. 219-249.

[44] Marcet, Albert and Ramon Marimon, 1999, 'Recursive Contracts,' mimeo, University of Pompeu Fabra.

[45] Matsuyama, Kiminori, 1999, 'Growing Through Cycles,' *Econometrica.*

[46] Parente, Stephen L., and Edward C. Prescott, 1994, Barriers to Technology Adoption and Development, *The Journal of Political Economy*, vol. 102, Issue 2, 298-321.

[47] Parente, Stephen L., and Edward C. Prescott, 1999, Monopoly Rights: A Barrier to Riches, *The American Economic Review*, vol. 89, no. 5.

[48] Prescott, Edward, 1986, 'Theory Ahead of Business Cycle Measurement,' Carnegie-Rochester Conference on Public Policy 24:11-44, Reprinted in Federal Reserve Bank of Minneapolis *Quarterly Review* 10:9-22.

[49] Rebelo, Sergio, 1991, 'Long-Run Policy Analysis and Long-Run Growth,' *Journal of Political Economy*, 99, 3, June, 500-521.

[50] Romer, David, 1996, *Advanced Macroeconomics*, McGraw-Hill.

[51] Romer, Paul, 1987, 'Growth Based on Increasing Returns Due to Specialization,' American Economic Review, 77, 2, (May), 56-62.

[52] Romer, Paul, 1989, 'Capital Accumulation in the Theory of Long-Run Growth,' in Robert Barro, ed. *Modern Business Cycle Theory*, Harvard University Press.

[53] Shleifer, A., 1986, Implementation cycles, *Journal of Political Economy* 94, 1163–1190.

[54] Stokey, Nancy, 1991, 'Credible Public Policy,' *Journal of Economic Dynamics and Control*, vol. 15, pp. 627-656.

[55] Summers, Lawrence, 1986, 'Some Skeptical Observations on Real Business Cycle Theory,' Federal Reserve Bank of Minneapolis *Quarterly Review.*

[56] Woodford, Michael, 1986, 'Stationary Sunspot Equilibria in a Finance Constrained Economy,' *Journal of Economic Theory*, vol. 40, no. 1, October.

[57] Woodford, Michael, 1991, 'Self-Fulfilling Expectations and Fluctuations in Aggregate Demand,' in N. Gregory Mankiw and David Romer, editors, *New Keynesian Economics, vol. 2, Coordination Failures and Real Rigidities,* MIT Press.