

Macroeconomics

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Course information.

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Nature of course and prerequisites. This is a second semester course in macroeconomics for first-year PhD students. I assume knowledge of the material taught in the first semester PhD course in macroeconomics.

Class meeting times. The class meets from 4:00 pm to 5:30 pm Mondays and Wednesdays. Spring break is the week of Monday, March 13. Reading “week” is Monday, May 1 to Wednesday, May 3. The time of the final will be announced later. The class meets in Eliot 316.

Prof. Bullard’s office hours. By appointment.

Teaching assistant. The teaching assistant for the course is Aarti Singh. Her office hours are Mondays from 2:45 to 3:45 or by appointment in McMillan 352.

Grading. The grade for the course will be based on assignments (25%), two midterms (25% each), and a final (25%).

Disclaimer. This syllabus is subject to change during the course.

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1. What to study?

1.1. Course overview.

Wednesday, January 18.

1.2. Lucas's calculation.

Monday, January 23.

Lucas, R.E., Jr. 1987. Models of Business Cycles, Part III, pp. 20-31.
Excerpt from the Yrjo Jahnsson lectures. Basil-Blackwell.

Lucas, R.E., Jr. 2003. Macroeconomic priorities. *American Economic Review* 93(1): 1-14.

Candidate exam question.

In what sense might economic fluctuations be viewed as a second-order issue for macroeconomics?

Background material.

Barlevy, G. 2004. The costs of business cycles and the benefits of stabilization: a survey. NBER Working Paper 10926.

Chatterjee, S. 2001. Why does countercyclical monetary policy matter? Business Review, Federal Reserve Bank of Philadelphia, Second Quarter.

Related papers.

Alvarez, F., and U. Jermann. 2004. Using asset prices to measure the cost of business cycles. *Journal of Political Economy* 112: 1223-1256.

Barlevy, G. 2004. The cost of business cycles under endogenous growth. *American Economic Review* 94(4): 964-990.

Chatterjee, S., and D. Corbae. 2000. On the welfare gains of reducing the likelihood of economic crises. Working paper, Federal Reserve Bank of Philadelphia and University of Texas.

Dolmas, J. 1999. Risk preferences and the welfare cost of business cycles. *Review of Economic Dynamics* 1: 646-676.

- Gali, J., M. Gertler, and J-D. Lopez-Salido. 2003. Markups, gaps and the welfare costs of business fluctuations. Working paper, CEPR.
- Krebs, T. 2004. The welfare cost of business cycles when markets are incomplete. Working paper, Brown University.
- Krueger, D., and F. Perri. 2003. On the welfare consequences of the increase in inequality in the United States. Working paper, Stanford and NYU.
- Krusell, P. and A. Smith. 1999. On the welfare effects of eliminating business cycles. *Review of Economic Dynamics* 2: 245-272.

1.3. Asset pricing puzzles.

Wednesday, January 25.

- Campbell, J., A. Lo, and A.C. MacKinlay. 1997. *The Econometrics of Financial Markets*. Princeton University Press, Chapter 8.

Candidate exam question.

- What is the nexus between asset pricing puzzles and the welfare cost of economic fluctuations?

Background material.

- Kocherlakota, N. 1996. The equity premium: it's still a puzzle. *Journal of Economic Literature*, 34(1): 42-71.
- Classic*: Mehra, R., and E. Prescott. 1985. The equity premium: a puzzle. *Journal of Monetary Economics*, 15: 145-162.

Related papers.

- Barro, R. 2005. Rare events and the equity premium. Manuscript, Harvard.
- Campbell, J. 1996. Consumption and the stock market: interpreting international evidence. NBER working paper #5610.
- Campbell, J., and J. Cochrane. 1999. By force of habit: a consumption-based explanation of aggregate stock market behavior. *Journal of Political Economy*, 107(2): 205-251.

- Epstein, L., and S. Zin. 1991. Substitution, risk aversion, and the temporal behavior of consumption and asset returns: An empirical investigation. *Journal of Political Economy* 99: 263-286.
- Goetzmann, W., and P. Jorion. 1999. Global stock markets in the twentieth century. *Journal of Finance* 54(3), June, pp. 953-80.
- Jermann, U. 2005. The equity premium implied by production. Manuscript, Wharton School, University of Pennsylvania.
- McGrattan, E., and E. Prescott. 2001. Taxes, regulations, and the value of U.S. corporations: a general equilibrium analysis. Working paper, University of Minnesota and Federal Reserve Bank of Minneapolis.
- McGrattan, E., and E. Prescott. 2003. Average debt and equity returns: Puzzling? Staff Report 313, Federal Reserve Bank of Minneapolis, January.

Some reference books on asset pricing and macroeconomics.

- Altug, S., and P. Labadie. 1994. *Dynamic Choice and Asset Markets*. Academic Press.
- Campbell, J., A. Lo, and A.C. MacKinlay. 1997. *The Econometrics of Financial Markets*. Princeton University Press.
- Cochrane, J. 2001. *Asset Pricing*. Princeton University Press.
- Siegel, J. 1998. *Stocks for the Long Run*. McGraw-Hill.

1.4. Structural change.

Monday, January 30.

- Hansen, B. 2001. The new econometrics of structural change: dating breaks in U.S. labour productivity. *Journal of Economic Perspectives* 97(1): 93-115.

Candidate exam question.

Are the macroeconomic data consistent with uninterrupted, balanced growth?

Background material.

- Diebold, F., and A. Senhadji. 1996. The uncertain unit root in real GNP: comment. *American Economic Review* 86(5): 1291-1298.
- Hamilton, J. 1989. A new approach to the economic analysis of nonstationary time series and the business cycle. *Econometrica* 57(2): 357-384.
- Issler, J.V., and A. A. de Mello Franco. 2003. On the welfare cost of business cycles in the 20th century. Working paper, Getulio Vargas Foundation, Rio de Janeiro.
- McConnell, M. and G-P. Quiros. 2000. Output fluctuations in the United States: what has changed since the early 1980s? *American Economic Review*, December, pp 1464-1476.
- Classic:* Nelson, C., and C. Plosser. 1982. Trends and random walks in macroeconomic time series: some evidence and implications. *Journal of Monetary Economics* 10(2): 139-62.
- Perron, P. 1989. The great crash, the oil price shock, and the unit root hypothesis. *Econometrica* 57(6): 1361-1401.
- Rotemberg, J. 2003. Stochastic technical progress, smooth trends, and nearly distinct business cycles. *American Economic Review* 93(5): 1543-1559.
- Stock, J., and M. Watson. 1988. Variable trends in economic time series. *Journal of Economic Perspectives* 2(3): 147-174.

A reference book on time series macroeconometrics.

- Hamilton, J. 1994. *Time series analysis*. Princeton University Press.

2. Growth.**2.1. A problem with growth via transition dynamics.**

Wednesday, February 1.

- King, R., and S. Rebelo. 1993. Transitional dynamics and economic growth in the neoclassical model. *American Economic Review* 83(4): 908-931.

Candidate exam question.

Do neoclassical transitional growth dynamics provide a satisfactory explanation for growth patterns observed over the last century?

Background on growth and development facts.

Parente, S., and E. Prescott. 1993. Changes in the wealth of nations. *Quarterly Review*, Federal Reserve Bank of Minneapolis, Spring, pp. 3-16.

Pritchett, L. 1997. Divergence, big time. *Journal of Economic Perspectives* Volume 11, Number 3 (Summer), pp. 3-18.

Summers, R., and A. Heston. 1991. The Penn world table (Mark 5): an expanded set of international comparisons, 1950-1988. *Quarterly Journal of Economics* CVI, 327-368.

Some papers on growth.

Acemoglu, D., and J. Ventura. 2002. The world income distribution. *Quarterly Journal of Economics*, May, pp. 659-694.

Lucas, R. 1988. On the mechanics of economic development. *Journal of Monetary Economics* 2(1): 3-42.

Lucas, R. 1990. Why doesn't capital flow from rich to poor countries? *American Economic Review* 80: 92-96.

Lucas, R. 1993. Making a miracle. *Econometrica* 61: 251-272.

Parente, S., and E. Prescott. 1999. Monopoly rights: a barrier to riches. *American Economic Review* 89: 1216-1233.

Prescott, E. 1998. Needed: A Theory of Total Factor Productivity. *International Economic Review* 39(3): 525-551.

Sala-i-Martin, X. 2002. The World Distribution of Income. NBER Working Paper #8933.

Related material.

Easterly, W. 2001. *The Elusive Quest for Growth: Economists' Adventures and Misadventures in the Tropics*. MIT Press.

- Levine, R., and D. Renelt. 1992. A sensitivity analysis of cross-country growth regressions. *American Economic Review* 82(4): 942-63.
- Lucas, R. 2000. Some macroeconomics for the 21st century. *Journal of Economic Perspectives* 14(1): 159-168.
- Sala-i-Martin, X. 1997. I just ran two million regressions. *American Economic Review* 87(2): 178-83.

2.2. Industrial revolution.

Monday, February 6.

- Hansen, G., and E. Prescott. 2002. Malthus to Solow. *American Economic Review* 92(4): 1205-1217.

Candidate exam question.

How do Hansen and Prescott reconcile modern, balanced growth with the widespread stagnation and poverty observed two or more centuries ago?

Book on worldwide growth patterns since 1000 AD.

- Maddison, A. 2001. *The World Economy: A Millennial Perspective*. Development Centre Studies, Organization for Economic Cooperation and Development.

Related research.

- Boldrin, M., L. Jones, and A. Khan. 2005. Three equations generating an industrial revolution? Working paper, University of Minnesota.
- Lucas, R. 2001. The industrial revolution: past and future. In R.E. Lucas, Jr., *Lectures on Economic Growth*. Harvard University Press.
- Laitner, J. 2000. Structural change and economic growth. *Review of Economic Studies* 67(3): 545-61.

2.3. Human capital and external effects.

Wednesday, February 8.

- Azariadis, C. and A. Drazen. 1990. Threshold externalities in economic development. *Quarterly Journal of Economics* 105: 501-26.

Candidate exam question.

How could a “poverty trap” be keeping per capita income low in many nations?

Related material.

Azariadis, C. 1996. The economics of poverty traps, part one: complete markets. *Journal of Economic Growth* 1996: 449-486.

Basu, S., and J. Fernald. 1997. Returns to scale in U.S. production: estimates and implications. *Journal of Political Economy* 105(2): 249-83.

Bils, M., and P. Klenow. 2000. Does schooling cause growth? *American Economic Review* 90: 1160-1183.

Manuelli, R., and A. Seshadri. 2005. Human capital and the wealth of nations. Manuscript, University of Wisconsin.

Romer, P. 1986. Increasing returns and long-run growth. *Journal of Political Economy*, 94(5): 1002-37.

Reference books on growth.

Aghion, P., and P. Howitt. 1998. *Endogenous growth theory*. MIT Press.

de la Croix, D., and P. Michel. 2002. *A theory of economic growth*. Cambridge University Press.

2.4. Two optimists ...**Monday, February 13.**

Jovanovic, B., and P. Rousseau. 2002. Moore’s law and learning by doing. *Review of Economic Dynamics* 5: 346-375.

Candidate exam question.

Describe reasons to be optimistic concerning the future of economic growth.

Background material.

Gordon, R. 2000. Does the new economy measure up to the great inventions of the past? *Journal of Economic Perspectives* 14(4): 49-74.

Oliner, S., and D. Sichel. 2000. The resurgence of growth in the late 1990s: is information technology the story? *Journal of Economic Perspectives* 14(4): 3-22.

More growth papers.

Jones, C. 1995. Time series tests of endogenous growth models. *Quarterly Journal of Economics* 110(2): 495-525.

McGrattan, E. 1998. A defense of AK growth models. Federal Reserve Bank of Minneapolis *Quarterly Review* 22(4): 13-27.

Ngai, L. R., and C. Pissarides. 2004. Structural change in a multi-sector model of growth. Working paper, London School of Economics. November.

2.5. ... and a pessimist.**Wednesday, February 15.**

Jones, C. 2002. Sources of U.S. economic growth in a world of ideas. *American Economic Review* 92(1): 220-239.

Candidate exam question.

Describe reasons to be pessimistic concerning the future of economic growth.

Growth via endogenous innovation.

Grossman, G., and E. Helpman. 1991. *Innovation and Growth in the Global Economy*. MIT Press.

Boldrin, M., and D. Levine. 2000. Perfectly competitive innovation. Working paper, University of Minnesota and UCLA.

2.6. First exam.

Monday, February 20. (President's Day is a National holiday but classes meet.)

3. Frictions.**3.1. Bewley's model.****Wednesday, February 22.**

Aiyagari, R. 1994. Uninsured idiosyncratic risk and saving. *Quarterly Journal of Economics* 109: 659-684.

Candidate exam question.

How might a lack of markets for income insurance distort macroeconomic equilibrium?

Related papers.

Castenada, A., J. Diaz-Gimenez, and J-V. Rios-Rull. 2003. Accounting for earnings and wealth inequality. *Journal of Political Economy* 111(4): 818-857.

DiNardi, M., and M. Cagetti. 2004. Wealth inequality: data and models. Manuscript, University of Minnesota.

Huggett, M., and S. Ospina. 1997. Idiosyncratic shocks: steady states and dynamics. *Journal of Monetary Economics* 39: 385-403.

Huggett, M., and S. Ospina. 2001. On aggregate precautionary savings: when is the third derivative relevant? *Journal of Monetary Economics* 48(2): 373-396.

Krueger, D., and F. Perri. 2005. Does income inequality lead to consumption inequality? Evidence and theory. CFS working paper 2005/15, Frankfurt.

Rios-Rull, J-V., and V. Quadrini. 1997. Understanding the U.S. distribution of wealth. Federal Reserve Bank of Minneapolis *Quarterly Review* 21(2): 22-36.

Rodriguez, S. B., J. Diaz-Gimenez, V. Quadrini, and J-V. Rios-Rull. 2002. Updated facts on the U.S. distributions of earnings, income, and wealth. Federal Reserve Bank of Minneapolis *Quarterly Review* 26(3): 2-35.

Dynamic efficiency.

- Abel, A., N.G. Mankiw, L. Summers, and R. Zeckhauser. 1989. Assessing dynamic efficiency: theory and evidence. *Review of Economic Studies* 56: 1-20.
- Bullard, J. and S. Russell. 1999. An empirically plausible model of low real interest rates and unbacked government debt. *Journal of Monetary Economics* 44(3): 477-508.
- Santos, M., and M. Woodford. 1997. Rational asset pricing bubbles. *Econometrica* 65: 19-57.
- Tirole, J. 1985. Asset bubbles and overlapping generations. *Econometrica* 53: 1499-1528.

Dynamic stochastic general equilibrium life-cycle models.

- Krueger, D., and F. Kubler. 2003. Pareto-improving social security reform when financial markets are incomplete. NBER working paper 9410.
- Krueger, D., and F. Kubler. 2003. Computing equilibrium in OLG models with stochastic production. *Journal of Economic Dynamics and Control* 28: 1411-1436.
- Rios-Rull, J-V. 1996. Life-cycle economies and aggregate fluctuations. *Review of Economic Studies* 63: 465-490.

3.2. Private information as a financial market friction.**Monday, February 27.**

- Azariadis, C., and B. Smith. 1998. Financial intermediation and regime switching in business cycles. *American Economic Review* 88(3): 516-36.

Candidate exam question.

In what sense could private information interfere with financial intermediation, thus becoming an important determinant of the nature of macroeconomic equilibrium?

Related material.

- Kiyotaki, N., and J. Moore. 1997. Credit cycles. *Journal of Political Economy* 2(105): 211-248.
- Carlstrom, C., and T. Fuerst. 1997. Agency costs, net worth, and business fluctuations: a computable general equilibrium analysis. *American Economic Review*.
- Bernanke, B., M. Gertler, and S. Gilchrist. 1998. The financial accelerator in a quantitative business cycle framework. NBER Working Paper #6455, March.
- Boyd, J., and B. Smith. 1998. Capital market imperfections in a monetary growth model. *Economic Theory* 11(2): 241-73.

3.3. Endogenous debt constraints.**Wednesday, March 1.**

- Azariadis, C., and L. Lambertini. 2003. Endogenous debt constraints in life-cycle economies. *Review of Economic Studies* 70: 461-487.

Candidate exam question.

- What are some of the implications of endogenous debt constraints for macroeconomics?

Related papers.

- Azariadis, C., and L. Kaas. Endogenous financial development, growth and volatility. Manuscript, UCLA and University of Vienna.
- Azariadis, C., and L. Lambertini. 2002. Excess asset returns with limited enforcement. *American Economic Review Papers and Proceedings*, May, pp. 135-140.
- Bulow, J., and K. Rogoff. 1989. A constant recontracting model of sovereign debt. *Journal of Political Economy* 97(1): 155-178.
- Kehoe, T., and D. Levine. 1993. Debt-constrained asset markets. *Review of Economic Studies* 60: 865-888.
- Alvarez, F., and U. Jermann. 2000. Efficiency, equilibrium, and asset pricing with risk of default. *Econometrica* 68: 775-797.

4. Government policy

4.1. Time consistency in policy choice.

Monday, March 6.

Jensen, C. 2003. Implementation delays and time-inconsistency in policy-making. Working paper, Southern Methodist University.

Candidate exam question.

Explain the nature of the time-inconsistency policy problem.

Related material.

Albanesi, S., V.V. Chari, and L. Christiano. 2001. How severe is the time inconsistency problem in monetary policy? NBER Working Paper 8139.

Sargent, T. 1999. *The Conquest of American Inflation*. Princeton University Press.

Sargent, T., and N. Williams. 2002. Impacts of priors on convergence and escapes from Nash inflation. Working paper, Princeton.

Stokey, N. 2002. Rules versus discretion after twenty-five years. *NBER Macroeconomics Annual 2002*.

4.2. Capital taxation.

Wednesday, March 8.

Erosa, A., and M. Gervais. 2001. Optimal taxation in infinitely-lived agent and overlapping generations models: a review. *Economic Quarterly*, Federal Reserve Bank of Richmond 87(2): 23-44.

Candidate exam question.

Explain the argument for not taxing capital.

Related material.

- Atkeson, A., V.V. Chari, and P. Kehoe. 1999. Taxing capital income: A bad idea. *Federal Reserve Bank of Minneapolis Quarterly Review*.
- Bull, Nicholas. 1993. When all the optimal dynamic taxes are zero. Working paper #137, July, Board of Governors.
- Chamley, Christophe. 1986. Optimal taxation of capital income in general equilibrium with infinite lives. *Econometrica* 54 (May): 607–22.
- Erosa, A., and M. Gervais. 2002. Optimal taxation in life-cycle economies. *Journal of Economic Theory* 105: 338-369.
- Golosov, M., and A. Tsyvinski. 2005. Optimal taxation with endogenous insurance markets. NBER working paper #11185, March.
- Jones, L., R. Manuelli, and P. Rossi. 1997. On the optimal taxation of capital income. *Journal of Economic Theory* 73(1): 93-117.
- Judd, Kenneth L. 1985. Redistributive taxation in a simple perfect foresight model. *Journal of Public Economics* 28 (October): 59–83.
- Kocherlakota, N. 2005. Zero expected wealth taxes: a Mirless approach to dynamic optimal taxation. *Econometrica*, forthcoming.

Recent papers on trade distortions.

- Yi, Kei-Mu. 2003. Can vertical specialization explain the growth of world trade? *Journal of Political Economy*, February, 52-102.
- Alvarez, F., and R.E. Lucas, Jr. 2004. General equilibrium analysis of the Eaton-Kortum model of international trade. Working paper, University of Chicago, October.

4.3. Spring Break.

Monday, March 13 and Wednesday, March 15.

4.4. Inflation as a tax.**Monday, March 20.**

- Lucas, R. 2000. Inflation and welfare. *Econometrica* 68(2): 247-274.

Candidate exam question.

What is the welfare cost of an ongoing inflation like the industrial world experienced in the 1970s, according to Lucas?

Related material.

Aiyagari, S., R. Braun, and Z. Eckstein. 1998. Transaction services, inflation, and welfare. *Journal of Political Economy* 106(6): 1274-1301.

Cooley, T., and G. Hansen. 1989. The inflation tax in a real business cycle model. *American Economic Review* 79(4): 733-748.

Heterogeneous agents.

Ventura, G., and A. Erosa. 1999. On inflation as a regressive consumption tax. Manuscript, University of Western Ontario.

Phelps's view.

Chari, V., L. Christiano, and P. Kehoe. 1996. Optimality of the Friedman Rule in economies with distorting taxes. *Journal of Monetary Economics* 37(2): 203-23.

Woodford, M. 1990. The optimum quantity of money. In B. Friedman and F. Hahn, eds., *The Handbook of Monetary Economics, Volume II*. Ch. 20, pp. 1067-1152.

Nominal taxation.

Abel, A. 1997. Comment [on Feldstein]. In C. Romer and D. Romer, *Reducing Inflation: Motivation and Strategy*. Chicago: University of Chicago Press, pp. 156-166.

Feldstein, M. 1997. The costs and benefits of going from low inflation to price stability. In C. Romer and D. Romer, *Reducing Inflation: Motivation and Strategy*. Chicago: University of Chicago Press, pp. 123-156.

Reference books on dynamic programming.

Adda, J., and R. Cooper. 2003. *Dynamic Economics*. MIT Press.

Stokey, N., R. Lucas, and E. Prescott. 1994. *Recursive Methods in Economic Dynamics*. Harvard University Press.

Lundqvist, L., and T. Sargent. 2002. *Recursive Dynamic Macroeconomics*. Harvard University Press.

4.5. Microfoundations of money.

Wednesday, March 22.

G. Rocheteau and R. Wright. 2003. Inflation and welfare in models with trading frictions. Working paper, Penn.

Candidate exam question.

Why do Rocheteau and Wright find a higher welfare cost of inflation than Lucas?

Related research.

Kiyotaki, N., and R. Wright. 1989. On money as a medium of exchange. *Journal of Political Economy* 97: 927-954.

Kiyotaki, N., and R. Wright. 1993. A search theoretic approach to monetary economics. *American Economic Review* 83(1): 63-77.

Kocherlakota, N. 1998. Money is memory. *Journal of Economic Theory* 81(2): 232-51.

Kocherlakota, N. 2004. Optimal monetary policy: what we know and what we don't know. *International Economic Review*, forthcoming.

Lagos, R., and R. Wright. 2002. A unified framework for monetary policy analysis. Working paper, NYU and Penn.

N. Wallace. 2001. Whither monetary economics? *International Economic Review* 42(4): 847-869.

4.6. Second exam.

Monday, March 27.

5. Fluctuations.**5.1. Technology-shock-driven business cycles.****Wednesday, March 29.**

Bullard, J., and J. Duffy. 2004. Learning and structural change in macroeconomic data. Working paper 2004-16A, Federal Reserve Bank of St. Louis.

Candidate exam question.

Outline an approach to solving an equilibrium business cycle model with a single shock to technology.

Related material.

Marimon, R., and A. Scott, (eds.), 1999. *Computational Methods for the Study of Dynamic Economies*. Oxford University Press.

Ljungqvist, L., and T. Sargent. 2004. *Recursive Macroeconomic Theory*. MIT Press. Second Edition.

5.2. The nature of technology shocks.**Monday, April 3.**

King, R., and S. Rebelo, 1999. Resuscitating real business cycles. NBER Working Paper #7534.

See also: Rebelo 2005, RBC's Past Present and Future. NBER wp.

Candidate exam question.

Does the idea that technology shocks have relatively small variance invalidate the hypothesis that such shocks are a primary business cycle driver?

Related material.

Christiano, L., M. Eichenbaum, R. Vigfusson. 2003. The response of hours to a technology shock: evidence based on direct measures of technology. Working paper, Northwestern.

- Francis, N., and V. Ramey. 2002. Is the technology-driven real business cycle hypothesis dead? Shocks and aggregate fluctuations revisited. Working paper #2002-03, UCSD.
- Gali, J., and P. Rabanal. 2004. Technology shocks and aggregate fluctuations: how well does the RBC model fit postwar U.S. data? Manuscript, Universitat Pompeu Fabra.
- Rebelo, S. 2005. Real business cycle models: Past, present, and future. Rochester Center for Economic Research Working Paper #522, December.
- Classic* Kydland, F., and E. Prescott. 1982. Time to build and aggregate fluctuations. *Econometrica*.
- Classic* Prescott, E. 1986. Theory ahead of business cycle measurement. *Minneapolis Fed Quarterly Review*.

Business cycles which are costly in Lucas's sense.

- Christiano, L. and J. Fisher. 2001. Habit persistence, asset returns, and the business cycle. *American Economic Review* 91(1): 149-66.
- Jermann, U. 1998. Asset pricing in production economies. *Journal of Monetary Economics* 41(2): 257-275.

5.3. Labor market frictions.

Wednesday, April 5.

- Andolfatto, D. 1996. Business cycles and labor market search. *American Economic Review*. 86(1): 112-132.

Candidate exam question.

Explain how a more realistic theory of labor market behavior can be merged with a standard equilibrium business cycle model.

Related material.

- Den Haan, W., G. Ramey, and J. Watson. 2000. Job destruction and the propagation of shocks. *American Economic Review* 90: 482-498.
- Gomme, P., R. Rogerson, P. Rupert, and R. Wright. 2004. The business cycle and the life cycle. Manuscript, Penn.

- Hansen, G. 1985. Indivisible labor and the business cycle. *Journal of Monetary Economics* 16(3): 309-327.
- Ljungqvist, L., and T. Sargent. 1998. The European unemployment dilemma. *Journal of Political Economy* 106(3): 514-50.
- Ljungqvist, L., and T. Sargent. 2003. European unemployment and turbulence revisited in a matching model. Working paper, NYU.
- Merz, M. 1995. Search in the labor market and the real business cycle. *Journal of Monetary Economics* 36: 269-300.
- Rogerson, R. 1988. Indivisible labor, lotteries and equilibrium. *Journal of Monetary Economics* 21(1): 3-16.
- Shimer, R. 1998. Why is the U.S. unemployment rate so much lower? *NBER Macroeconomics Annual 1998*.
- Shimer, R. 2004. The cyclical nature of hires, separations, and job-to-job transitions. Manuscript, University of Chicago.
- Shimer, R. 2005. Reassessing the ins and outs of unemployment. Manuscript, University of Chicago.
- Trigari, A. 2003. Equilibrium unemployment, job flows and inflation dynamics. Working paper, Bocconi.
- Walsh, C. 2003. Labour market search and monetary shocks. In S. Altug, J. Chadha, and C. Nolan, eds., *Dynamic Macroeconomic Analysis: Theory and Policy in General Equilibrium*. Cambridge, UK: Cambridge University Press.

Worker flows.

- Blanchard, O., and P. Diamond. 1990. The cyclical behavior of the gross flows of U.S. workers. *Brookings Papers on Economic Activity* 0(2): 85-143.
- Davis, S., J. Haltiwanger, and S. Schuh. 1996. *Job Creation and Destruction*. MIT Press.

5.4. Home production.

Monday, April 10.

Kydland, F., P. Rupert, and P. Gomme. 2001. Home production meets time to build. *Journal of Political Economy* 109(5): 1115-31.

Candidate exam question.

Explain how considering home production might alter our thinking about equilibrium business cycle dynamics.

Related material.

Benhabib, J., R. Rogerson, and R. Wright. 2001. Homework in macroeconomics: household production and aggregate fluctuations. *Journal of Political Economy* 99: 1166-87.

Greenwood, J., R. Rogerson, and R. Wright. Household production in real business cycle theory. In *Frontiers of Business Cycle Research*, edited by Thomas F. Cooley. Princeton University Press.

McGrattan, E., R. Rogerson, and R. Wright. 1997. An equilibrium model of the business cycle with household production and fiscal policy. *International Economic Review* 38: 267-90.

5.5. The legacy of Friedman and Schwartz.**Wednesday, April 12.**

Romer, C., and D. Romer. 1989. Does monetary policy matter? A new test in the spirit of Friedman and Schwartz. *NBER Macro Annual*.

Candidate exam question.

What are the strengths and weaknesses of the narrative approach to understanding the real effects of monetary policy actions?

Related research.

Christiano, L., R. Motto, M. Rostagno. 2004. The Great Depression and the Friedman-Schwartz hypothesis. Working paper, Northwestern.

Friedman, M., and A. Schwartz. 1963. *A Monetary History of the United States, 1867-1960*. Princeton University Press.

- Romer, C., and D. Romer. 2002. The evolution of economic understanding and postwar stabilization policy. In *Rethinking Stabilization Policy*, Federal Reserve Bank of Kansas City.
- Sargent, T. 2002. Reaction to the Berkeley story. Manuscript, NYU, invited comment on Romer and Romer (2002).

Commentary on Friedman and Schwartz.

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- Bruno, M., and W. Easterly. 1998. Inflation crises and long-run growth. *Journal of Monetary Economics* 41(1): 3-26.
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- Uhlig, H. 2005. What are the effects of monetary policy on output? Results from an agnostic identification procedure. *Journal of Monetary Economics* 52(2): 381-419.

Money directly in the real business cycle model.

- Cooley, T., and G. Hansen. 1989. The inflation tax in a real business cycle model. *American Economic Review* 79(4): 733-748.
- Cooley, T., and G. Hansen. 1995. Money and the business cycle. In: T. Cooley, ed., *Frontiers of Business Cycle Research*. Princeton University Press.
- Freeman, S., and F. Kydland. 2000. Monetary aggregates and output. *American Economic Review* 90(5): 1125-35.

5.6. Woodford's "new monetarist" model.**Monday, April 17.**

- Walsh, C. 2003. *Monetary Theory and Policy*, MIT Press. Chapter 5, pp. 230-268.

Candidate exam question.

Outline Woodford's approach to the analysis of monetary policy.

Related material.

- Woodford, M. 1999. Revolution and evolution in twentieth-century macroeconomics. Manuscript, Princeton University.
- Woodford, M. 2003. *Interest and prices*. Princeton University Press.

Concerning the sticky price assumption.

- Bils, M., and P. Klenow. 2002. Some evidence on the importance of sticky prices. NBER working paper #9069.
- Chari, V., P. Kehoe, and E. McGrattan. 2000. Sticky price models of the business cycle: can the contract multiplier solve the persistence problem? *Econometrica* 68(5): 1151-79.
- Dotsey, M., R. King, and A. Wolman. 1999. State-dependent pricing and the general equilibrium dynamics of money and output. *Quarterly Journal of Economics* 114: 665-690.
- Golosov, M., and R.E. Lucas, Jr. 2003. Menu costs and Phillips curves. NBER working paper #10187, December.

Green, E. 2005. A review of *Interest and Prices: Foundations of a Theory of Monetary Policy* by Michael Woodford. *Journal of Economic Literature* Volume XLIII, March.

5.7. Stabilization policy.

Wednesday, April 19.

Rotemberg, J., and M. Woodford. 1999. Interest rate rules in an estimated sticky price model. In J. Taylor, ed., *Monetary Policy Rules*. Chicago: University of Chicago Press, also NBER Working papers #6618.

Candidate exam question.

What is the optimal Taylor-type monetary policy rule according to Rotemberg and Woodford?

Related material.

Clarida, R., J. Gali, and M. Gertler. 1999. The science of monetary policy: A new Keynesian perspective. *Journal of Economic Literature* XXXVII(4): 1661-1707.

Christiano, L., and C. Gust. 1999. Taylor rules in a limited participation model. In J. Taylor, ed., *Monetary Policy Rules*. Chicago: University of Chicago Press.

Classic Taylor, J. 1993. Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy* 15: 151-200.

Taylor, J., ed., 1999. *Monetary Policy Rules*. Chicago: University of Chicago Press.

Woodford, M. 1999. Optimal monetary policy inertia. NBER working paper #7261.

5.8. Learnability for policy rule selection.

Monday, April 24.

Bullard, J. and K. Mitra. 2002. Learning about monetary policy rules. *Journal of Monetary Economics* 49: 1105-1129.

Candidate exam question

Explain how “learnability” might restrict the set of Taylor-type policy rules a central bank considers.

Related material.

Evans and Honkapohja, 2002. Adaptive learning and monetary policy design. Working paper. University of Oregon.

Book on learning and macroeconomics

Evans, G., and S. Honkapohja. 2001. *Learning and Expectations in Macroeconomics*. Princeton University Press.

5.9. Global dynamics and Taylor’s rule.**Wednesday, April 26.**

Benhabib, J., S. Schmitt-Grohe, and M. Uribe. 2001. The perils of Taylor rules. *Journal of Economic Theory* 96: 40-69.

Candidate exam question.

What is the argument of Benhabib et al. concerning potential “liquidity trap” equilibria, and why might their argument be considered quite general?

Related material.

Benhabib, J., S. Schmitt-Grohe, and M. Uribe. 2001. Monetary policy and multiple equilibria. *American Economic Review* 91: 167-186.

Benhabib, J., S. Schmitt-Grohe, and M. Uribe. 2002. Avoiding liquidity traps. *Journal of Political Economy* 110: 535-563.