



College of Business Administration
Department of Economics
Macro Theory
Lecturer: O. Mikhail
ECO 7205-0001
Fall 2002

Course Outline

Time : Th 18:00-20:50.
Location : BA 206.
Office : BA 360.
Office Hours : TTh 15:00 – 16:30.
Web Page :
<http://www.bus.ucf.edu/omikhail/Eco7206/F2002/Eco-7205-f2002.htm>
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Objective:

The goal of macroeconomics is twofold. First, it develops positive models to help understanding the dynamics of key macroeconomic variables, and second one uses these models to make judgments about what policies to pursue or not to pursue.

The objective of this class is to present the tools required to study Dynamic Stochastic General Equilibrium (DSGE) models and to apply these to topics in macroeconomics. Given the nature of the audience, there is emphasis on Macro-Finance relations.

We start by presenting the stylized facts and the puzzles in macroeconomics, and then we investigate different types of models proposed to explain and to analyze these facts. Within a general equilibrium framework, we construct artificial economies using Real Business Cycle (RBC) models. The bulk of the class evolves around the theoretical construction, methods of solving and criticisms to RBC models. Finally, we examine the proposed models to answer questions of interests.

Each student will be assigned a Linux account for computational purposes. The Fortran 77 compiler is available on the server.

Pre-requisite:

- 1) An intermediate level of calculus, algebra and statistics.
- 2) A programming language such as: GAUSS, FORTRAN or MATLAB (i.e., concepts such as statements, logical and loop type).

Evaluation:

- Assignments – Type I - (Weekly Summary) 10 %
- Assignments – Type II 15 %
- Mid-Term Exam 25 %
- Final Exam 50 %

The Type I assignments are a two page weekly summary of one article from Snowdon and Vane (1997).

Books:

- Azariadis, Costas. (1993) *Intertemporal Macroeconomics*. Blackwell Publishers, Cambridge, Massachusetts, ISBN: 1-55786-366-0.
- Barro, Robert J. (1989) *Modern Business Cycle Theory*. Harvard University Press. ISBN: 0-674-57860-0.
- **Black, Fischer. (1995) *Exploring General Equilibrium*. MIT Press, Cambridge, Massachusetts, ISBN: 0-262-02382-2.**
- Cooley, Thomas, F. (1995) *Frontiers of Business Cycle Research*. Princeton University Press, ISBN: 0-691-04323-X.
- Eberwein, Curtis, J. (1996) Lecture Notes, Department of Economics, McGill University.
- Judd, Kenneth L. (1998) *Numerical Methods in Economics*. MIT Press, ISBN: 0-262-10071-1.
- Hildenbrand, W. and A. P. Kirman. (1988) *Equilibrium Analysis*. North-Holland, ISBN: 0-444-70511-2.
- **Marimon, Ramon and Andrew Scott (2001) *Computational Methods for the Study of Dynamic Economies*. Oxford University Press. ISBN: 0-19-924827-3**
- McCandless, George T. and Wallace, Neil. (1991) *Introduction to Dynamic Macroeconomic Theory: An Overlapping Generations Approach*. Harvard University Press, ISBN: 0-674-46111-8.
- Roger, Farmer E. (1993) *The Macroeconomics of Self-Fulfilling Prophecies*. MIT Press, Cambridge.
- Romer, David. (1996) *Advanced Macroeconomics*. McGraw-Hill, New York, ISBN: 0-07-053667-8.
- **Snowdon, Brian and Vane, Howard. (1997) *A Macroeconomics Reader*. Routledge. ISBN: 0-415-15716-1.**
- Sargent, Thomas J. (1987) *Dynamic Macroeconomics Theory*. Harvard University Press, Cambridge, ISBN: 0-674-21877-9.
- **Ljungqvist, Lars and Thomas Sargent (2000) *Recursive Macroeconomic Theory*. The MIT Press. ISBN: 0-262-19451-1**

OPTIONAL/ADDITIONAL for Finance Students

- Branimarte, Paolo (2002) *Numerical Methods in Finance*. Wiley Series in Probability and Statistics, Wiley Inter-Science, John Wiley & Sons, Inc. ISBN: 0-471-39686-9

READING LIST

Introduction

Topics: Advanced Undergraduate Macroeconomics - Puzzles - Stylized Facts – Constructing Artificial Economies – Types of Models - Aspects of General Equilibrium - Issues in General Equilibrium.

- Barro, Robert. (2000) *Macroeconomics*. MIT Press, Third Edition, ISBN: 0-262-02436-5.
- Black, Fischer. Parts I, II and III.
- Diebold, F. and Rudebusch, G. “Measuring Business Cycles: A modern Perspective.” *Review of Economics and Statistics*, pp. 67-77.
- Hendricks, Lutz. (2000) “General Notes – Math Review – Static Optimization - Introduction.” Lecture Notes.
- Kydland, Finn E. (1995) “Business Cycles and Aggregate Labor Market Fluctuations.” In *Frontiers of Business Cycle Research*, T. F. Cooley, ed. Princeton University Press.
- Lucas, Robert. (1976) “Understanding Business Cycles.” Carnegie- Rochester Series on Public Policy 6.
- Mankiw, N. G. (1990) “A Quick Refresher Course in Macroeconomics.” *Journal of Economic Literature* XXVIII: pp. 1645-1660.
- Romer, David. (1996) Chapter 1.
- Smith, Gregory. (1999) Lecture Notes. Chapter 1, pp. 1-18.
- Sims, Christopher A. (1980) “Macroeconomics and Reality.” *Econometrica*, vol. 48, no. 1, pp. 1-48.
- Sims, Christopher A. (1995) “Macroeconomics and Methodology.” *Journal of Economic Perspectives*, vol. 10, pp. 105-120.
- Young, Eric R. (2001) Lectures in Dynamic General Equilibrium. Florida State University. <http://garnet.acns.fsu.edu/~eyoung/>
- Waelti, Manuel (2002) Lecture Notes. University of Bern. <http://www.vwi.unibe.ch/staff/waelti/>

Development of Macroeconomics

- Woodford, Michael. (1999) “Revolution and Evolution in Twentieth-Century Macroeconomics.” Working Paper, Princeton University.
- Akerlof, George A. (2002) “Behavioral Macroeconomics and Macroeconomic Behavior.” *American Economic Review*, pp. 411-433.

The Business Cycle

- Romer, Christina D. (1999) “Changes in Business Cycles: Evidence and Explanations.” *National Bureau of Economic Research*, Working Paper 6948, <http://www.nber.org/papers/w6948>

- Zarnowitz, Victor. (1998) “Has the Business Cycle Been Abolished?” *National Bureau of Economic Research*, Working Paper 6367, <http://www.nber.org/papers/w6367>

Discounted Utility and Expectations

- Frederick, Shane., George Loewenstein and Ted O’Donoghue. (2002) Time Discounting and Time Preference: A Critical Review.” *Journal of Economic Literature*, vol. XL, no. 2, pp. 351-401.
- Carroll, Christopher D. (2001) “The Epidemiology of Macroeconomic Expectations.” *National Bureau of Economic Research*, Working Paper 8695, <http://www.nber.org/papers/w8695>
- Loewenstein, George and Drazen Prelec. (1992) “Anomalies in Intertemporal Choice: Evidence and an Interpretation.” *Quarterly Journal of Economics*, vol. 107, Issue 2, May, pp. 573-597.

Dynamic Stochastic GE models and Dynamic Programming

Topics: Welfare Theorems – Real Business Cycle – Calibration versus System of Equations.

- Azariadis, C. (1993) Chapters 1, 2, 4 and 6.
- Boileau, Martin. (2000) “A Child’s Guide to Dynamic Programming – Two Period Economies – Optimal Control Theory.” Lecture Notes.
- Campbell, J. (1994) “Inspecting the Mechanism: An Analytical Approach to the Stochastic Growth Model.” *Journal of Monetary Economics*, vol. 33, no. 3, pp. 463-506.
- Cooper, Russell. (2000) “Dynamic Programming: An Overview.” Lecture Notes.
- Farmer, Roger. (1993) Chapters 2 and 3.
- Hendricks, Lutz. (2000) “Dynamic Programming – Two and Three Period Models – Value Function and One-Sector Growth Model.” Lecture Notes.
- King, Ian P. (1987) “A Simple Introduction to Dynamic Programming in Macroeconomic Models.” Mimeo Queen’s University.
- King, Robert G. Plosser, Charles I. and Rebelo, Sergio T. (2000) “Resuscitating Real Business Cycles.” *Handbook of Macroeconomics*.
- King, Robert G. Plosser, Charles I. and Rebelo, Sergio T. (1988a) “Production, Growth and Business Cycles: I. The basic Neoclassical Model.” *Journal of Monetary Economics*, vol. 21, pp. 195-232.
- King, Robert G. Plosser, Charles I. and Rebelo, Sergio T. (1988b) “Production, Growth and Business Cycles: II. New Directions.” *Journal of Monetary Economics*, vol. 21, pp. 309-341.
- Kydland, F. and Prescott, E. (1982) “Time to Build and Aggregate Fluctuations.” *Econometrica*, vol. 50, pp. 1345-1370.
- Kydland, F. and Prescott, E. (1996) “The Computational Experiment: An Econometric Tool.” *Journal of Economic Perspectives*, vol. 10, no. 1, pp. 69-85.

- Long, John B. Jr. and Plosser, Charles I. (1983) “Real Business Cycles.” *Journal of Political Economy*, vol. 91, no. 1, pp. 39-69.
- Mankiw, N. G. (1989) “Real Business Cycle: a New Keynesian Perspective.” *Journal of Economic Perspective*, pp. 79-90.
- Mankiw, N. G. Rotemberg, J. and Summers, L. “Intertemporal Substitution in Macroeconomics.” *Quarterly Journal of Economics*, vol. 100, pp. 225-253.
- McCallum, Bennett T. (1989) “Real Business Cycle Models.” In Barro (1989).
- McGrattan, E. (1994) “A Progress Report on Business Cycle Models.” Federal Reserve Bank of Minneapolis, *Quarterly Review*, vol. 18, no. 4.
- Plosser, C. (1989) “Understanding real Business Cycles.” *Journal of Economic Perspectives*, vol. 3, pp. 51-77.
- Prescott, Edward. (1991) “Real Business Cycle Theories: What Have we Learned?” *Working Paper 486*, Federal Reserve of Minneapolis.
- Prescott, Edward. (1986) “Theory Ahead of Business Cycle Measurement.” *Minneapolis Quarterly Review*, pp. 9-22.
- Quah, Danny T. (1995) “Business Cycle Empirics: Calibration and Estimation.” *The Economic Journal*, vol. 105, pp. 1594-1596.
- Romer, Davis. (1996) Chapter 4.
- Sargent, Thomas. (1987) Chapter 1.
- Smith, Gregory. (1999) Lecture Notes. Chapter 2, pp. 19-85 and Chapter 4. pp. 124-226.
- Stadler, George W. (1994) “Real Business Cycles.” *Journal of Economic Literature*, vol. XXXII, December, pp. 1750-1783.
- Summers, Lawrence. (1986) “Some Skeptical Observations on Real Business Cycle Theory.” *Quarterly Review*, Federal Reserve Bank of Minneapolis.

Solution Methods

- De La Fuente, A. (2000) *Mathematical Methods and Models for Economists*. Cambridge University Press, Chapters 12 and 13. “Discrete and Continuous Time Intertemporal Optimization.”
- Smith, Gregory. (1999) Lecture Notes. Chapter 3, pp. 86-123.
- Taylor, John B. and Uhlig, Harald. (1990) “Solving Nonlinear Stochastic Growth Models: A Comparison of Alternative Solution Methods.” *Journal of Business and Economic Statistics*, vol. 8, no. 1, pp. 1-17.
- Christiano (1998) “Solving Dynamic Equilibrium Models by a Method of Undetermined Coefficients.” Manuscript.
- Letendre, Marc-Andre (2001) “Estimating Parameters of RBC Models using GMM.” Lecture Notes. McMaster University.
- Ramon, Marimon and Scott, Andrews. (1999) “Computational Methods for the Study of Dynamic Economies.” Oxford University Press.
- Sims, Christopher. (2000) “Linearized Stochastic Modes.” Lecture Notes.
- Uhlig, Harald. (1997) “A Toolkit for Analyzing Nonlinear Dynamic Stochastic Models Easily.” Memo, CentER, University of Tilburg and CPER.

Genetic Algorithms versus Evolutionary Programming

- Gomme, Paul. (1996) "Evolutionary Programming as a Solution Technique for the Bellman Equation." Mimeo, Simon Fraser University.

Analytical versus Numerical: 101 for Beginners

- Uhlig, Taylor (2001) "A Toolkit for Analysing Nonlinear Dynamic Stochastic Models Easily." in Ramon Marimon and Andrew Scott (2001) *Computational Methods for the Study of Dynamic Economies*. Oxford University Press, footnote 3, p. 30.

Accuracy of the Numerical Solution?

- Den Hann, W. J. and Marcet, A. (1994) "Accuracy in Simulations." *Review of Economic Studies*, vol. 61, pp. 3-17.
- Judd, Kenneth L. (1998) Numerical Dynamic Programming. Chapter 12.
- Santos, M.S. and J. Vigo. (1996) "Error Bounds for a Numerical Solution for Dynamic Economic Models." *Applied Math. Lett.* Vol. 9, No. 4, pp. 41-45.

Evaluating DSGE

- Bauwens, Luc. Lubrano, Michel. and Richard, Jean-Francois. (1999) *Bayesian Inference in Dynamic Econometric Models*. Advanced Texts in Econometrics, Ed. Granger. C.W.J. and Mizon, G.E. Oxford University Press; New York.
- DeJong, David N. Ingram, Beth F. and Whiteman, Charles H. (1997) "A Bayesian Approach to Dynamic Macroeconomics." Manuscript.
- Landon-Lane, John. (1999) "Evaluating Real Business Cycle Models: The Data Transformation Problem." *Working Paper*, School of Economics, The University of New South Wales, Sydney, Australia.
- Schorfheide, Frank. (2000) "Loss Function Based Evaluation of DSGE Models." *Working Paper*, University of Pennsylvania, Department of Economics, June.
- Sims, Christopher. (2000) "Choosing Priors." Lecture Notes.
- Sims, Christopher. (2000) "The Calibration Debate." Lecture Notes.
- Watson, Marc. (1993) "Measures of Fit for Calibrated Models." *Journal of Political Economy*, vol. 101, pp. 1011-1041.
- Zellner, Arnold. (1971) *An Introduction to Bayesian Inference in Econometrics*. John Wiley & Sons, Inc., New York.

Consumption-Based Models and Finance

Topics: Economics versus Finance. Levels of asset returns versus volatility of returns (e.g., Bomfim and Reinhart (2000), Kuttner (1999), Roley and Sellon (1998), Thornton (1998), and Reinhart and Simin (1997)), Consumption Models.

- Bomfim, Antulio N. (2000) “Pre-Announcement Effects, News, and Volatility: Monetary Policy and the Stock Market.” *Finance and Economics Discussion Series*, Division of Research, Statistics and Monetary Affairs, Federal Reserve Board, Washington, D.C.
- Campbell, J. “Asset Pricing, Consumption and the Business Cycle.” *Handbook of Macroeconomics*, Chapter 19, Elsevier.
- Carroll, C. (1997) “Death to the Log-Linearized Consumption Euler Equation.” *NBER Working Paper #6298*.
- Castanias, Richard P. II (1979) “Macroinformation and the Variability of Stock market Prices.” *Journal of Finance*, vol. 34, pp. 439-450.
- Cochrane, John H. (2001) *Asset Pricing*. Princeton University Press, ISBN: 0691074984, Chapter 2.
- Cooper, Russell. (2000) “Consumption and Investment.” Lecture Notes.
- Deaton, Angus. (1992) *Understanding Consumption*. Clarendon Lectures in Economics. Oxford University Press, ISBN: 0198288247.
- Hall, Robert. (1989) “Consumption.” In Barro (1989).
- Hall, Robert. (1978) “Stochastic Implications of the Life-Cycle Permanent Income Hypothesis: Theory and Evidence.” *Journal of Political Economy*, vol. 86, pp. 971-987.
- Kocherlakota, Narayana R. (1996) “The Equity Premium: It’s Still a Puzzle.” *Journal of Economic Literature*, vol. XXXIV, March, pp. 42-71.
- Ljungqvist, Lars and Sargent, Thomas. (2000) *Recursive Macroeconomic Theory*. MIT Press, ISBN:0262194511, Chapters 7 and 10.
- Lucas, Robert E. Jr. (1978) “Asset Prices in an Exchange Economy.” *Econometrica*, vol. 46, no. 6, pp. 1429-1445.
- Mankiw, N. G. (1982) “Hall’s Consumption Hypothesis and Durable Goods.” *Journal of Monetary Economics*, vol. 10, pp. 417-425.
- Muellbauer, John and Lattimore, Ralph. (1995) “The Consumption function: A Theoretical and Empirical Overview.” *Handbook of Applied Econometrics: Macroeconomics*. Ed. Pesaran and Wickens, Blackwell publishers Ltd.
- Romer, David (1996) Chapters 7 and 8.
- Rouwenhorst, Geert K. (1995) “Asset Pricing Implications of Equilibrium Business Cycle Models.” In *Frontiers of Business Cycle Research*, Thomas F. Cooley, ed. Princeton University Press. Chapter 10.
- Sargent, Thomas. (1987) Chapter 3.

Empirical Saving

- Peach, Richard and Charles Steindel. (2000) “A Nation of Spendthrifts? An Analysis of Trends in Personal and Gross Saving.” *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, vol. 6, no. 10, September.

Asset pricing issues require a general equilibrium models

- Breeden, D. T. (1986) “Consumption, Production, Inflation and Interest Rates: A Synthesis.” *Journal of Financial Economics*, vol. 16, pp. 3-39.

- Cox, Ingersoll and Ross (1985) “An Intertemporal General Equilibrium Model of Asset Prices.” *Econometrica*, vol. 53, pp. 363-384.

Asset prices and the Cost of Business Cycles

- Alvarez, Fernando and Urban J. Jermann. (2000) “Using Asset Prices to Measure the Cost of Business Cycles.” *National Bureau of Economic Research, Working Paper 7978*, <http://www.nber.org/papers/w7978>

CAPM

- Jagannathan, Ravi and Ellen R. McGrattan. (1995) “The CAPM Debate.” *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 19, no.4, Fall, pp. 2-17.

The Labor Market

Topics: Real Business Cycle, the Labor Market, Government and Policy, Sectoral versus Aggregate Shocks.

- Aiyagari, R. Christiano, L. and Eichenbaum, Martin. (1992) “The Output, Employment and Interest Rate Effects of Government Consumption.” *Journal of Monetary Economics*, vol. 30, pp. 73-86.
- Barro, Robert J. (1990) “The Ricardian Approach to Budget Deficits.” *Journal of Economic Perspectives*, vol. 3, pp. 32-54.
- Benassi, Corrado. Chirco, Alessandra. and Colombo, Caterina. (1994) *The New Keynesian Economics*. Basil Blackwell, Inc. Oxford U.K., and Cambridge U.S.
- Burnside, Craig. Eichenbaum, Martin. and Fisher, J. “Assessing the Effects of a Fiscal Policy Shock.” Manuscript.
- Chari, V. V. Christiano, L. J. and Kehoe, P. J. (1995) “Policy Analysis in Business Cycle Models.” In *Frontiers of Business Cycle Research*, T. F. Cooley, ed. Princeton University Press.
- Christiano, L. and Eichenbaum, M. (1992) “Current real Business Cycle Theories and Aggregate labor Market Fluctuations.” *American Economic Review*, vol. 82, pp. 430-450.
- Hall, Robert E. (1998) “Labor-Market Frictions and Unemployment Fluctuations.” *National Bureau of Economic Research, Working Paper Series* no. 6501.
- Hansen, G. and Wright, R. (1992) “The Labor Market in Real Business Cycle Theory.” *Quarterly Review*, Federal Reserve Bank of Minneapolis, Spring.
- Lilien, David M. (1982) “Sectoral Shifts and Cyclical Unemployment.” *Journal of Political Economy*, vol. 90, no. 4, pp. 777-793.
- Ljungqvist, Lars and Sargent, Thomas. (2000) *Recursive Macroeconomic Theory*. MIT Press, ISBN:0262194511, Chapters 9 and 12.
- Long, John B. Jr. and Plosser, Charles I. (1987) “Sectoral versus Aggregate Shocks in the Business Cycle.” *American Economic Review: Papers and Proceedings*, vol. 77, pp. 333-336.
- Lucas, Robert E. (1976) “Econometric Policy Evaluation: A Critique.” *Carnegie-Rochester Series on Public Policy*.

- Millard, Stephen. Scott, Andrew and Sensier, Marianne. (1999) “Business Cycles and the Labour Market: Can the Theory Fit the Facts?” *Working Paper Series no. 93*, Bank of England.
- Mulligan, Casey B. (1999) Microfoundations and Macro Implications of Indivisible Labor.” NBER, Working Paper 7116, <http://www.nber.org/papers/w7116>
- Mulligan, Casey B. (2001) “Aggregate Implications of Indivisible Labor.” *Advances in Macroeconomics*. Vol. 1, issue 1, article 4.
- Romer, David (1996) Chapters 5, 6 and 10.
- Sims, Christopher. (2000) “Dynamic Fiscal Policy.” Lecture Notes.

Empirical Hours Worked

- McGrattan, Ellen R. and Richard Rogerson. (1998) “Changes in Hours Worked Since 1950.” *Federal Reserve Bank of Minneapolis Quarterly Review*, vol. 22, no. 1, winter, pp. 2-19.

Is the model wrong or is it bad empirical measurements?

- Abraham, Katherine G. (1995) “Real Wages and the Business Cycle.” *Journal of Economic Literature*, Vol. XXXIII, September, pp. 1215-1264.

Equilibrium Employment

- Pissarides, Christopher A. (2000) *Equilibrium Unemployment Theory*. The MIT Press. ISBN: 0-262-16187-7
- Shimer, Robert (2002) *Equilibrium Unemployment Fluctuations*. Working paper. Princeton University. <http://www.princeton.edu/~Eshimer/wp/fluctuations.pdf>

Value of Money

Topics: Real Business cycle and Money, Currency in the Utility Function, cash in Advance and OLG.

- Cooley, T. F. and Hansen, Gary D. (1995) “Money and the Business Cycle.” In *Frontiers of Business Cycle Research*, T. F. Cooley, ed. Princeton University Press.
- Cooper, Russell (2000) “Overlapping Generations Models.” Lecture Notes.
- Hendricks, Lutz. (2000) “Money in OLG Models – Cash in Advance Models.” Lecture Notes.
- McCandless, G. T. and Wallace, N. (1991) Chapters 1, 2, 3, 4, 5 and 6.
- Sargent, Thomas. (1987) Chapters 4, 5, 6 and 7.