

Economics 60202: Macro Theory II

Spring 2013

The University of Notre Dame

Times and Locations:

Tuesdays and Thursdays, 4:00-6:00 in DeBartolo 138

Instructor:

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Course Overview:

This is the second of the required core courses in macroeconomic theory for students in the PhD program. Dynamic stochastic general equilibrium (DSGE) models have become the standard workhorse models for the analysis of aggregate fluctuations. The primary focus of the course will be on the analysis, solution, calibration, estimation, and extension of DSGE models. In addition, students will be introduced to basic tools in time series econometrics, including detrending, vector autoregressions, the generalized method of moments, etc. The treatment of time series will be aimed at practitioners and should not be viewed as a substitute for a formal course in econometric theory.

Modern macroeconomics is a quantitative science. As such, students will be expected to perform quantitative exercises using a computer program, most preferably MATLAB (this is the programming language for which I will offer support). You will also be asked to download Dynare, which is a set of codes used to solve, simulate, and estimate DSGE models. In addition, students should have access to Eviews, which will perform most basic time series analysis and is easy to use.

Evaluation and Grading:

Evaluation for the course will be based on two exams and eight problem sets. The midterm exam will be on Thursday, March 7. We can be flexible on the date and time of the final exam, but it must occur sometime between May 3 and May 11. The midterm exam will account for 30 percent of the course grade, while the final exam will count for 40 percent.

The remaining 30 percent of the course grade will be based on the eight problem sets. While eight is a large number, practice is essential for learning the course material. The due dates for the eight problem sets will be determined as we progress through the semester. While students may consult with one another in completing the problem sets, it is expected that each student turn in his/her own assignments.

Textbook and Readings:

There is no single assigned textbook for the course. Rather, class lectures will draw on a number of different sources which are listed below, as well as my own typed notes, which will be made available to you online. If you are serious about macroeconomics, it would be a good idea to have these books on your shelf. As we progress through the course, I will highlight any important (i.e. required) readings.

Enders, Walter. *Applied Econometric Time Series*, 2nd edition.

Gali, Jordi. *Monetary Policy, Inflation, and the Business Cycle*.

Hamilton, James. *Time Series Analysis*.

Ljungqvist, Lars and Thomas Sargent. *Recursive Macroeconomic Theory*, 2nd edition.

McCandless, George. *The ABCs of RBCs*.

Romer, David. *Advanced Macroeconomics*, 3rd edition.

Walsh, Carl. *Monetary Theory and Policy*, 3rd edition.

Wickens, Michael. *Macroeconomic Theory*.

Course Website:

I will post course materials to my personal website at the following address:

http://www.nd.edu/~esims1/grad_macro_11.html. You can reach this page by going to my personal webpage, then click on “courses,” then click on “Graduate Macro Spring 2013.” The course materials posted here will include the syllabus, notes, and problem sets.

Links to online readings, problem set solutions, and Matlab codes will be emailed to you or are already contained in the syllabus.

Office Hours:

There are no formal office hours. I am usually in my office most days during “regular” business hours, so feel free to drop by at any time. I am also frequently in on weekends and am always available via email.

Course Outline:

The following is a rough and preliminary outline of the topics we will be covering this semester. It may change, and some topics may be either added or subtracted at the instructor’s discretion.

- (1) Time Series
 - a. ARMA models
 - b. Markov Chains
 - c. Unit roots
 - d. Detrending

- e. Vector Autoregressions
 - i. Reduced form vs. structural
 - ii. Orthogonalization
 - iii. Impulse Responses
 - iv. Variance Decompositions
 - v. Cointegration

Suggested Readings:

Hamilton, Ch. 1-3

Enders, Ch. 1; Ch. 2; Ch. 4; Ch. 5

Ljungqvist and Sargent, Ch.1

Cochrane, John. *Time Series for Macroeconomics and Finance*,

http://faculty.chicagobooth.edu/john.cochrane/research/papers/time_series_book.pdf

(2) Background on Modern Macroeconomics

- a. Keynesian macro: IS-LM, the Phillips Curve, and large scale macroeconomic models
- b. Rational Expectations and the Lucas Critique
- c. The DSGE revolution

Suggested Readings:

Wickens, Chapter 1.

Mankiw, Greg. “A Quick Refresher Course in Macroeconomics.” *Journal of Economic Literature*, 1990.

http://www.economics.harvard.edu/files/faculty/40_Quick_Refresher.pdf

Lucas, Robert. “Econometric Policy Evaluation: A Critique.” In K. Brunner and A. Meltzer (eds.), “The Phillips Curve and Labor Markets”, *Carnegie-Rochester Conference Series on Public Policy*, 1976.

<http://www.econ.umn.edu/~ceyhun/teaching/summer08/48903/lucas1976.pdf>

(3) Real Business Cycle Models

- a. Stochastic neoclassical growth model
 - i. Phase diagram
 - ii. Solution techniques: value function iteration vs. linearization
- b. The basic real business cycle (RBC) model
 - i. Solution techniques: value function iteration vs. linearization
 - ii. Calibration
 - iii. Simulation
 - iv. Evaluation
- c. Using Dynare to solve DSGE models

Suggested Readings:

McCandless, Ch. 5; Ch.6, sections 1-3

- Wickens, Ch. 2; Ch. 4
- Kydland, Finn and Ed Prescott. “Time to Build and Economic Fluctuations.” *Econometrica*, 1982.
[http://www.jstor.org/sici?sici=0012-9682\(198211\)50:6%3C1345:TTBAAF%3E2.0.CO;2-E&origin=repec](http://www.jstor.org/sici?sici=0012-9682(198211)50:6%3C1345:TTBAAF%3E2.0.CO;2-E&origin=repec)
- King, Robert and Sergio Rebelo. “Resuscitating Real Business Cycles.” *Handbook of Macroeconomics*, 2000.
http://rcer.econ.rochester.edu/RCERPAPERS/rcer_467.pdf
- Campbell, John. “Inspecting the Mechanism: An Analytical Approach to the Stochastic Growth Model.” *Journal of Monetary Economics*, 1994.
<http://www.sciencedirect.com/science/article/B6VBW-45JK65V-G/2/2109f12d2e23abdf8020c878f860ed3f>

(4) Extensions of the Basic Real Business Cycle Model

- a. Investment
 - i. Convex adjustment costs and q theory
 - ii. Non-convex adjustment costs
- b. Government spending shocks
- c. Business cycle accounting
- d. Habit formation
- e. Variable Utilization
- f. Unemployment
 - i. Indivisible Labor
 - ii. Search Theory
- g. Money and Inflation
 - i. Cash in advance
 - ii. Money in the utility function
 - iii. Seignorage

Suggested Readings:

- McCandless, Ch. 6, sections 4-6; Ch. 8; Ch. 9
- Wickens, Ch. 8, Ch. 14
- Walsh, Ch. 2-3
- Hayashi, Fumio. “Tobin’s Marginal q and Average q : A Neoclassical Interpretation.” *Econometrica*, 1982.
[http://www.jstor.org/sici?sici=0012-9682\(198201\)50:1%3C213:TMQAAQ%3E2.0.CO;2-P&origin=repec](http://www.jstor.org/sici?sici=0012-9682(198201)50:1%3C213:TMQAAQ%3E2.0.CO;2-P&origin=repec)
- Chari, VV, Patrick Kehoe, and Ellen McGrattan. “Business Cycle Accounting.” *Econometrica*, 2007.
<http://www.econ.umn.edu/~kehoe/papers/CKMeconometrica2007.pdf>
- Aiyagari, S. Rao, Lawrence Christiano, and Martin Eichenbaum. “The Output, Employment, and Interest Rate Effects of Government Consumption.” *Journal of Monetary Economics*, 1992.
<http://www.nber.org/papers/w3330>
- McGrattan, Ellen. “The Macroeconomic Effects of Distortionary Taxation.” *Journal of Monetary Economics*, 1994.

<http://www.minneapolisfed.org/research/DP/DP37.pdf>

Burnside, Craig, Martin Eichenbaum, and Sergio Rebelo. "Labor Hoarding and the Business Cycle." *Journal of Political Economy*, 1993.

<http://www.nber.org/papers/w3556>

Burnside, Craig and Martin Eichenbaum. "Factor Hoarding and the Propagation of Business Cycle Shocks." *American Economic Review*, 1996.

<http://www.nber.org/papers/w4675>

Hansen, Gary. "Indivisible Labor and the Business Cycle." *Journal of Monetary Economics*, 1985.

<http://individual.utoronto.ca/zheli/C9.pdf>

Mortensen, Dale and Christopher Pissarides. "Job Creation and Destruction in the Theory of Unemployment." *Review of Economic Studies*, 1994.

[http://www.jstor.org/sici?sici=0034-6527\(199407\)61:3%3C397:JCAJDI%3E2.0.CO;2-U&origin=bc](http://www.jstor.org/sici?sici=0034-6527(199407)61:3%3C397:JCAJDI%3E2.0.CO;2-U&origin=bc)

Cooley, Thomas and Gary Hansen. "The Inflation Tax in a Real Business Cycle Model." *American Economic Review*, 1989.

[http://www.jstor.org/sici?sici=0002-8282\(198909\)79:4%3C733:TITIA%3E2.0.CO;2-F&origin=repec](http://www.jstor.org/sici?sici=0002-8282(198909)79:4%3C733:TITIA%3E2.0.CO;2-F&origin=repec)

(5) New Keynesian Models

- a. Stylized facts on price adjustment
- b. Imperfect competition and price-setting
- c. Sticky wages and prices
 - i. Taylor model
 - ii. Calvo model
- d. New Keynesian Phillips Curve
 - i. Non-neutrality
 - ii. Contract multiplier
 - iii. Strategic complementarity
- e. Optimal Monetary Policy in the New Keynesian model

Suggested Readings:

McCandless, Ch. 10-11

Wickens, Ch. 9

Gali, Ch. 3

Walsh, Ch. 6, Ch. 8

Clarida, Richard, Jordi Gali, and Mark Gertler. "The Science of Monetary Policy: A New Keynesian Perspective." *Journal of Economic Literature*, 1999.

<http://www.nyu.edu/econ/user/gertlerm/science.pdf>

(6) Medium scale quantitative models

- a. Sticky prices and capital
- b. Basic Christiano, Eichenbaum, and Evans / Smets-Wouters framework
- c. Model evaluation
- d. A quick introduction to model estimation

- i. Estimation vs. calibration
- ii. GMM interpretation
- iii. Maximum likelihood

Suggested Readings:

- Christiano, Lawrence, Martin Eichenbaum, and Charles Evans. “Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy.” *Journal of Political Economy*, 2005.
http://economics.uwo.ca/grad/9603a001/papers/Christiano_Eich_evans_JPE_2005_Nominal_Rigidities.pdf
- Smets, Rafael and Frank Wouters. “Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach.” *American Economic Review*, 2007.
<http://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.97.3.586>
- Ruge-Murcia, Francisco. “Methods to Estimate Dynamic Stochastic General Equilibrium Model.” *Journal of Economic Dynamics and Control*, 2007.
http://www.cireq.umontreal.ca/personnel/ruge_methods.pdf

(7) Other Topics

- a. Time consistency
- b. Financial frictions

Suggested Readings:

- Kydland, Finn and Ed Prescott. “Rules Rather than Discretion: The Inconsistency of Optimal Plans.” *Journal of Political Economy*, 1977.
[http://www.jstor.org/sici?sici=0022-3808\(197706\)85:3%3C473:RRTDTI%3E2.0.CO;2-A&origin=repec](http://www.jstor.org/sici?sici=0022-3808(197706)85:3%3C473:RRTDTI%3E2.0.CO;2-A&origin=repec)
- Bernanke, Ben, Mark Gertler, and Simon Gilchrist. “The Financial Accelerator in a Quantitative Business Cycle Framework.” *Handbook of Macroeconomics*, 1999.
<http://www.nber.org/papers/w6455.pdf>
- Carlstrom, Charles, and Tim Fuerst. “Agency Costs, Net Worth, and Business Fluctuations: A Computable General Equilibrium Analysis.”
<http://www.jstor.org/sici?sici=0002-8282%28199712%2987%3A5%3C893%3AACNWAB%3E2.0.CO%3B2-V&origin=repec>