Economics 60202: Macro Theory II
Spring 2017
The University of Notre Dame

Times and Locations:
Tuesdays and Thursdays, 8:45-10:45 AM in Flanner 725

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. Macroeconomics is a broad field interested in the "big" questions. Why do economies grow over time, and how can they grow faster? Why are some countries rich and others poor? Why do we have business cycles? What is the cause of business cycles? How should monetary and fiscal policy be conducted, and how should they react to short run fluctuations?

This particular course will focus on issues in "short run" macro, mostly in a closed economy setting. We will do so using equilibrium models that take agent optimization, dynamics, and expectations formation seriously. 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. We will work with these models in conjunction with data, discussing how to calibrate, estimate, and evaluate these models. We will then use the models to think about economy policy.

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. Many of the problem sets will feature a heavy MATLAB component. I strongly believe in "learning by doing," and I think you learn well by coding things up yourself. This quantitative work will have the added advantage of leaving you well-equipped to begin doing your own research in macroeconomics in the coming years.

Evaluation and Grading:

Evaluation for the course will be based on two exams and eight problem sets. The midterm exam will be given during the normal class time on Thursday, March 10 (at a time to be determined), and the final exam will be given at a date and time to be determined during the week of May 8. These dates are somewhat flexible and can be moved if there are conflicts with the other courses in the graduate sequence. 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. The problem sets will be graded on a check plus, check, check minus system.

I would like to add a final note about grading in PhD courses. Your ultimate objective is to complete your PhD and get a job using the skills that you build up while here. A necessary condition to move to the research stage of the PhD is to pass the comprehensive exams in both micro and macro theory. Your grades in the core courses are not that relevant other than as a signal for how you are doing and how you might expect to do on the comps. From my perspective, you can think of grades in the A range (either A or A-) as signaling a level of performance that portends passing the comps at the PhD level. B and B+ grades are passes only at the Masters level; less than a B in a PhD course represents unsatisfactory progress that would suggest you are in danger of failing the comp.

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.

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*.

I have each of these books in my office. Should you want to borrow one, feel free to ask me.

Course Website:
I will post course materials to my personal website at the following address: https://www3.nd.edu/~esims1/grad_macro_17.html. You can reach this page by going to my personal webpage, then click on "courses," then click on "Graduate Macro Spring 2017." The course materials posted here will include the syllabus, notes, and problem sets.

Links to online readings, problem set solutions, and Matlab codes will 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-in" at any time. Alternatively, you may email in advance to make an appointment. If you choose the "drop-in" option (coming to my office without an appointment), I reserve the option to re-schedule you for a later time if I am busy with something else.

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) Preliminaries
          a. Notation
          b. Expectations
          c. Stochastic Processes
          d. Impulse Responses
          e. Filtering
          f. Lucas Critique
          g. Introduction to general equilibrium: two period consumption-saving model

    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

(2) 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
   d. First order vs. higher order approximations
   e. Generalized impulse responses
   f. Using second order approximations for welfare analysis

   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
      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

(3) Extensions of the Basic Real Business Cycle Model
   a. Adjustment costs
   b. Habit formation
   c. Variable factor utilization
   d. Business cycle accounting
   e. Fiscal policy
      i. Ricardian Equivalence
      ii. Distortionary taxes and debt
   f. 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

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

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:TITIAR%3E2.0.CO;2-F&origin=repec

Baxter, Marianne and Robert King. "Fiscal Policy in General Equilibrium." *American Economic Review*, 1983 http://people.bu.edu/mbaxter/papers/fpol.pdf

(4) New Keynesian Models
   a. Stylized facts on price adjustment
   b. Imperfect competition and price-setting
   c. Sticky prices
       i. Rotemberg Pricing
       ii. Calvo model

      d. New Keynesian Phillips Curve
      e. Optimal Monetary Policy in the basic New Keynesian model
      f. Wage stickiness

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
    Erceg, Christopher, Dale Henderson, and Andrew Levin. "Optimal Monetary Policy with Staggered Price and Wage Contracts." *Journal of Monetary Economics,* 2000. http://www.sciencedirect.com/science/article/pii/S0304393200000283
    Gali, Jordi and Olivier Blanchard. "Real Wage Rigidities and the New Keynesian Model." *Journal of Money, Credit, and Banking*, 2007. http://www.nber.org/papers/w11806.pdf?new_window=1%7C

(5) The Zero Lower Bound

Suggested Readings:
    Christiano, Lawrence, Martin Eichenbaum, and Sergio Rebelo. "When is the Government Spending Multiplier Large?" *Journal of Political Economy*, 2011. http://www.jstor.org/stable/10.1086/659312
    Eggertson, Gauti and Michael Woodford. "The Zero Bound on Interest Rates and Optimal Monetary Policy." *Brookings Papers on Economic Activity*, 2003. http://www.columbia.edu/~mw2230/BPEA.pdf

(6) Medium scale quantitative models
      a. Sticky prices and capital
      b. Basic Christiano, Eichenbaum, and Evans / Smets-Wouters framework
      c. Sources of shocks
      d. Model evaluation
      e. 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

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

Jermann, Urban and Vincenzo Quadrini. "Macroeconomic Effects of Financial Shocks." *American Economic Review* 2012. http://www-bcf.usc.edu/~quadrini/papers/CSpap.pdf