University of Maryland
Department of Economics

Economics 701

Advanced Macroeconomics I

Fall 2015

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Office Hours : Tuesday 11:30-12:30 (or by appointment)

Time and Location : M W 11:00 – 12:15, Tydings 0101

OUTLINE AND OBJECTIVE OF THE COURSE

This is a first course in **advanced** macroeconomics. In your first-year classes you learned about some of the basic modeling techniques. In this class, we go over two major paradigms in modern macroeconomics: the Neoclassical (Real Business Cycle) and the New Keynesian. In doing so we go through the historical progression of ideas that lead to the current state of the literature. We also touch upon models with frictions – those in the labor market and in financial markets. About half of the course is devoted to substance. Not all the papers we cover are on the frontier of research, and this is intentional. We need to understand where we came from. The other half of the course is devoted to computational techniques. We cover many tools that help macroeconomists build, solve and take their model to the data.

TEXTBOOKS AND OTHER READING MATERIAL

Most of the course will be based on articles, which are listed on the course outline and these will be available electronically.

I do not require you to purchase any particular book for this course. The following books are recommended:

Recursive Macroeconomic Theory, Third Edition, Ljungqvist and Sargent, 2012 (LS)

Recursive Methods in Economic Dynamics, Stokey and Lucas, Harvard University Press, 1989

These two are a must-have for any macroeconomist so we assume you already have them.

Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework, 2008, Gali

Monetary Theory and Policy, Third Edition, Walsh

Interest and Prices: Foundations of a Theory of Monetary Policy, Princeton University Press, 2003**,** Woodford.

Equilibrium Unemployment Theory, Second Edition, 2000, Pissarides

These four books are very useful for the topic they cover. We may briefly refer to them. You may want to buy a subset of them depending on your interests.

PREREQUISITES

ECON 601 and ECON 602. Students who have not taken these courses and/or students from other departments must talk to us before taking this course.

AUDITING POLICY

Students who have officially taken ECON 701 before or otherwise cannot take it for credit, are welcome to audit this course subject to my approval and they must talk to me.

DROPBOX

All students need to create a Dropbox account. It is free and will be essential for sending files back and forth.

GRADING

Computational Problem Sets (25%)

Throughout the course I will assign four computational problem sets. You will have about a week to work on each of these. You will work in groups of two that will rotate. These problem sets will require you to write codes in MATLAB and/or work with Eviews, both of which are installed on the department's network and available in the computer lab. In addition to turning in a nicely-formatted description of your findings with all the necessary tables and figures (preparing documents that are neat and easy to read is a necessary condition to being a good researcher), you will need to upload all to Dropbox.

Below are the key dates for problem sets. You will have between 7 to 14 days to work on these problem sets, depending on their difficulty. No extensions will be given. The time it may take you to complete these problem sets is a stochastic variable which cannot be predicted beforehand. As such, I suggest you start working on them as soon as they are assigned.

Problem Set 1: Assigned on 9/14. Due on **9/21 by 5 pm** via email.

Problem Set 2: Assigned on 9/21. Due on **9/30 by 5 pm** via email.

Problem Set 3: Assigned on 9/30. Due on **10/14 by 5 pm** via email.

Problem Set 4: Assigned on 10/26. Due on **11/9 by 5 pm** via email.

Paper Summaries (20%)

You need to carefully read and summarize the findings of **four** papers. These papers are marked in the reading list below. Your summaries need to be nicely formatted and should be no longer than 2 pages. You need to provide not just a pure summary of the paper but also a critical one. Your summaries are due by email one week after the respective lecture is covered in class. I will not be announcing these deadlines and it's your responsibility to keep track of them.

Proposal (15%)

You need to write a paper proposal. More details will be provided in due time.

Project (40%)

The final project will be substantially longer than a problem set and will involve replicating the results of a published paper. The project will have two explicit deadlines, one for producing intermediate results and a final deadline which is January 24, 2016, Sunday at 5 pm. No late submissions will be accepted. More details will be provided in due time.

POLICIES AND IMPORTANT NOTES

- Unless previously announced, the class will meet on all Mondays and Wednesdays the university is officially open.
- Our primary mean for communication outside the classroom is email. I will try to respond to your emails in a timely fashion. We will maintain an email list of all students and may use this list for relaying important information. Please check your email regularly.

READING LIST

Papers with (*) are required readings and you are expected to read them **before** the related lecture. Papers with (#) are papers for the "Paper Summaries" requirement of the course. The others are optional. All papers are available on Dropbox. Follow this link :

http://tinyurl.com/econ701-Fall2015

Don't print all these papers immediately. As we progress, it will become clear which ones you will study in greater detail.

Lecture 1 – Introduction

(*) Aruoba, S. Boragan and Jesus Fernandez-Villaverde (2015), "A Comparison of Programming Languages in Economics", *Journal of Economic Dynamics and Control*, 58, 265-273.

Lecture 2 – The RBC Model – What is It?

(*) Kydland, Finn E. and Edward C. Prescott (1991), "The Econometrics of the General Equilibrium Approach to Business Cycles," *Scandinavian Journal of Economics*, 93(2), 161-178.

(*) King, Robert G. and Sergio T. Rebelo (1999), "Resuscitating Real Business Cycles," *Handbook of Macroeconomics*,Volume 1, Chapter 14.

(*) Prescott, Edward C. (1986), "Theory Ahead of Business Cycle Measurement," *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall 1986, 9-22.

Kydland, Finn E. and Edward C. Prescott (1982), "Time to Build and Aggregate Fluctuations," *Econometrica*, 50(6), 1345-1370.

Plosser, Charles I. (1989), "Understanding Real Business Cycles," *Journal of Economic Perspectives*, 3(3), 51-77.

Altug, Sumru and Warren Young (2013), "Real Business Cycles After Three Decades: A Panel Discussion with Edward Prescott, Finn Kydland, Charles Plosser, John Long, Thomas Cooley, and Gary Hansen," *Macroeconomic Dynamics*, 1-21

Lecture 3 – Calibration

(*) Candler, Graham and Edward Prescott (2008), "Calibration", *New Palgrave Dictionary of Economics*

(*) Cooley, Thomas F. and Edward C. Prescott (1995), "Economic Growth and Business Cycles," *Frontiers of Business Cycle Research* (Thomas F. Cooley ed.), Princeton University Press, Chapter 1.

Canova, Fabio (1994), "Statistical Inference in Calibrated Models", *Journal of Applied Econometrics*, 9, S123-S145

Lecture 4 – Basic Numerical Methods

Chapters 1, 2, 5, and 7.7 in Judd (1998). [If you need a reference]

Chapter 3 in Adda and Cooper (2003). [If you need a reference]

Tauchen, George (1986), "Finite State Markov-Chain Approximations to Univariate and Vector Autoregressions", *Economic Letters*, 20, 177-181

Lecture 5 – Local Approximation Methods and Dynare

Dynare User Guide by Tommaso Mancini Griffoli.

Judd, Kenneth L. and Sy-Ming Guu (1997), "Asymptotic Methods for Aggregate Growth Models", *Journal of Economic Dynamics and Control*

Lecture 6 – Global Approximation Methods

(*) Judd, Kenneth L. (1992), "Projection Methods for Solving Aggregate Growth Models", *Journal of Economic Theory*, 58, 410-452

(*) Christiano, Lawrence J. and Jonas D.M. Fisher. (2000), "Algorithms for solving dynamic models with occasionally binding constraints," *Journal of Economic Dynamics and Control*, 24, 1179-1232

Judd, Kenneth L., Lilia Maliar and Serguei Maliar, (2010), "A Cluster-Grid Projection Method: Solving Problems with High Dimensionality," NBER Working Paper 15965

McGrattan, Ellen R. (1999), "Application of Weighted Residual Methods to Dynamic Economic Models", in *Computational Methods for the Study of Dynamic Economies*, R. Marimon and A. Scott eds., Oxford University Press

Lecture 7 – Comparison of Methods

(*) Aruoba, S. Boragan, Jesus Fernandez-Villaverde and Juan F. Rubio-Ramirez (2006), "Comparing Solution Methods for Dynamic Equilibrium Economies", *Journal of Economic Dynamics and Control,* 30, 2477-2508

Lecture 8 – VARs / Structural VARs

(*) Christiano, Lawrence J., Martin Eichenbaum and Charles Evans (1999), "Monetary Policy Shocks: What Have We Learned and to What End?", *Handbook of Macroeconomics.*

(*) Christiano, Lawrence J., Martin Eichenbaum and Robert Vigfusson (2003), "What Happens After a Technology Shock?", *mimeo.*

Gali, Jordi (1999), "Technology, Employment, and the Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations?", *American Economic Review*

Christiano, Lawrence J., Martin Eichenbaum and Robert Vigfusson (2006), "Assessing Structural VARs", *NBER Macroeconomics Annual.*

Chari, V.V., Patrick J. Kehoe and Ellen R. McGrattan (2008), "Are Structrual VARs with Long-Run Restrictions Useful in Developing Business Cycle Theory", *Journal of Monetary Economics,* 55(8), 1337–1352.

Kehoe, Patrick J. (2006), "How to Advance Theory with Structural VARs: Use the Sims-Cogley-Nason Approach", *NBER Macroeconomics Annual*

(*) Uhlig, Harald (2005), "What are the effects of monetary policy on output? Results from an agnostic identification procedure,'' *Journal of Monetary Economics,* 52, 381-419

Lecture 9 – Criticism of the RBC Model

(*) Mankiw, N. Gregory (1989), "Real Business Cycles: A New Keynesian Perspective," *Journal of Economic Perspectives,* 3(3), 79-90

(*) Manuelli, Rodolfo E. (1986), "Modern Business Cycle Analysis: A Guide to the Prescott-Summers Debate," *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall 1986, 3-8.

(*) Summers, Lawrence H. (1986), "Some Skeptical Observations on Real Business Cycle Theory," *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall 1986, 23-27.

(*) Prescott, Edward C. (1986), "Response to a Skeptic," *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall 1986, 28-33.

Lecture 10 – New Keynesian Model – What Is It?

(*) Goodfriend, Marvin and Robert G. King (1997), "The New Neoclassical Synthesis and the Role of Monetary Policy," *NBER Macroeconomics Annual*, 231-296.

(*) Woodford, Michael (2009), "Convergence in Macroeconomics: Elements of the New Synthesis," *American Economic Journal: Macroeconomics*, 1(1), 267-279.

(#) Christiano, Lawrence J., Martin Eichenbaum and Charles Evans (2005), "Nominal Rigidities and the Dynamics Effects of a Shock to Monetary Policy", *Journal of Political Economy*.

Smets Frank and Rafael Wouters (2007), "Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach," *American Economic Review*, 97(3), 586-606.

Lecture 11 – GMM – Theory and Estimation (New Keynesian Phillips Curve Application)

(*) Hansen, L.P. and K.J. Singleton (1982), "Generalized Instrumental Variables Estimation of Nonlinear Rational Expectations Models", *Econometrica*, 50, 1269-86, and Errata: *Econometrica*, 52, 267-68

(*) Nason, James M. and Gregor W. Smith (2008), "The New Keynesian Phillips Curve: Lessons from Single-Equation Econometric Estimation," *Federal Reserve Bank of Richmond Economic Quarterly*, 94(4), 361-395.

Hansen, Lars Peter (1982), "Large Sample Properties of Generalized Method of Moments Estimators," *Econometrica*, 50(4), 1029-1054.

Christiano, Lawrence J. and Martin Eichenbaum (1992), "Current Real-Business-Cycle Theories and Aggregate Labor-Market Fluctuations", *American Economic Review*, 82(3), 430-450

Smith Jr, Anthony A. (1993), "Estimating Nonlinear Time-Series Models Using Simulated Vector Autoregressions", *Journal of Applied Econometrics,* 8, S63-S84

Stock, J. H., and Wright, J. H. (2000), "GMM With Weak Identification," *Econometrica*, 68, 1055–1096.

Lecture 14 – Estimation of DSGE Models (Linear)

(*) An, Sungbae and Frank Schorfheide (2007), "Bayesian Analysis of DSGE Models", *Econometric Reviews*, 26, 113-172

Del Negro, Marco and Frank Schorfheide (2011), "Bayesian Macroeconometrics," in *The Oxford Handbook of Bayesian Econometrics*, J. Geweke, G. Koop, and H. van Dijk (eds.), Oxford University Press, 293-389.

(#) Smets, Frank and Rafael Wouters (2007), "Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach", *American Economic Review*, 97(3), 586-606.

Lecture 15 – Estimation of DSGE Models (Nonlinear)

(*) Fernandez-Villaverde, Jesus and Juan F. Rubio-Ramirez (2007) "Estimating Macroeconomic Models: A Likelihood Approach", *Review of Economic Studies*, 74, 1059–1087.

Lecture 16 – Calibration vs. Estimation

(*) Kydland, Finn E. and Edward C. Prescott (1996), "The Computational Experiment: An Econometric Tool", *Journal of Economic Perspectives*, 10, 69-85

(*) Hansen, Lars Peter and James J. Heckman (1996), "The Empirical Foundations of Calibration", *Journal of Economic Perspectives*, 10, 87-104

(*) Sims, Christopher A. (1996), "Macroeconomics and Methodology", *Journal of Economic Perspectives*, 10, 105-120

Rios-Rull, Jose-Victor, Frank Schorfheide, Cristina Fuentes-Albero, Maxym Kryshko, and Raul Santaeulalia-Llopis, (2012), "Methods versus Substance: Measuring the Effects of Technology Shocks," *Journal of Monetary Economics*, 59(8), 826–846

Lecture 17 – Criticism of the New Keynesian Model

(*) Chari, V.V., Patrick J. Kehoe, and Ellen R. McGrattan. 2009. "New Keynesian Models: Not Yet Useful for Policy Analysis." *American Economic Journal: Macroeconomics*, 1 (January): 242–66.

Lecture 18 – Search Models of the Labor Market

(*) Rogerson, Richard, Robert Shimer and Randall Wright (2005), "Search-Theoretic Models of the Labor Market: A Survey," *Journal of Economic Literature*, 43, 959-988.

(#) Shimer, Robert (2005), "The Cyclical Behavior of Equilibrium Unemployment and Vacancies," *American Economic Review*, 95(1), 25-49

Lecture 19 – Models with Financial Frictions

(*) Quadrini, Vincenzo (2011), "Financial Frictions in Macroeconomic Fluctuations," *Economic Quarterly*, 97(3), 209–254.

Bernanke, Ben, Mark Gertler, and Simon Gilchrist (1999), "The Financial Accelerator in a Quantitative Business Cycle Framework", *Handbook of Monetary Economics* Vol. 1C, 1341-1393.

Gertler, Mark and Nobuhiro Kiyotaki (2010), "Financial Intermediation and Credit Policy in Business Cycle Analysis", *Handbook of Monetary Economics* Vol. 3A, 547-599.

(#) Gertler, Mark and Peter Karadi (2011), "A Model of Unconventional Monetary Policy", *Journal of Monetary Economics* 58(1), 17-34.

Carlstrom, Charles and Timothy Fuerst (1997), "Agency Costs, Net Worth, and Business Fluctuations: A Computable General Equilibrium Analysis", *American Economic Review* 87(5), 893-910.

Curdia, Vasco and Michael Woodford (2010), "The Central Bank Balance Sheet as an Instrument of Monetary Policy", *NBER Working Paper* 16208.

Kiyotaki, Nobuhiro and John Moore (1997), "Credit Cycles", *Journal of Political Economy* 105(2), 211-248.

Kiyotaki, Nobuhiro and John Moore (2008), "Liquidity, Business Cycles, and Monetary Policy", *mimeo*. and *NBER Working Paper* 17934.

COURSE OUTLINE

Dates	Lecture	Topic
Aug 31	1	Introduction
Sept 2	2	RBC Model – What Is It?
Sept 9	3	Calibration
Sept 14	4	Basic Numerical Methods
Sept 16-21	5	Local Approximation Methods and Dynare
Sept 23-28-30	6	Global Approximation Methods
Oct 5-7	7	Comparison of Methods
Oct 12-14	8	VARs / Structural VARs
Oct 19	9	Criticism of the RBC Model
Oct 21-26	10	New Keynesian Model – What Is It?
Oct 28 Nov 2-4	11	GMM – Theory and Estimation (New Keynesian Phillips Curve Application)
Nov 4	12	State Space Methods and the Kalman Filter
Nov 9	13	Bayesian Estimation – Theory
Nov 11-16	14	Estimation of DSGE Models (Linear)
Nov 18	15	Estimation of DSGE Models (Nonlinear)
Nov 23	16	Calibration vs. Estimation
Nov 25	17	Criticism of the New Keynesian Model
Nov 30 Dec 2	18	Search Models of the Labor Market
Dec 7-9	19	Models with Financial Frictions