ECON 782
Seminar in Empirical Macroeconomics
American University, Spring 2010

Instructor: Luca Guerrieri
Email: luca_guerrieri@yahoo.com
Office: 202 Roper
Office Hours: Thursday, 10:00 -12:00
Course Webpage:

Course Description
This is a seminar course for Ph.D. students who have an interest in pursuing research in empirical macroeconomics. It is designed to provide you with techniques necessary for conducting and presenting independent research in applied macroeconomics. The focus will be on recent developments in time series techniques and their application to macroeconomic issues.

During the first half of the semester, I will use the lectures for teaching time series tools and techniques useful for macroeconometric research. As the semester progresses, the lectures will gradually involve student-led discussions and presentations of empirical papers. The selection of papers included in this course is intended to expose you to econometric tools commonly used in empirical macroeconomics.

Prerequisites
Students are expected to have completed: Econ 705, Econ 723.

Objectives
The specific goals of this seminar are:
• To enhance your knowledge of the relevant concepts and techniques
necessary to understand empirical macroeconomics as published in leading
journals;
• To improve your ability to read and evaluate critically current empirical research on
macroeconomics;
• To prepare you to conduct and present independent research.

Course Requirements
• Each student is expected to complete the homework assignments. Cooperation in completing the assignments is encouraged. Most of the assignments will require some computer programming. You can choose the programming language that you prefer, but I would encourage exploring the use of Matlab.
• Each student is expected to write a short summary and lead the discussion of an applied econometric paper. The summary needs to be distributed to your fellow classmates ahead of the discussion.
• Each student is expected to write and present an original empirical research paper on a macroeconomic problem.

The list of starred papers given below is supposed to give you ideas for the choice of published papers suitable for class presentation. The major requirement for this class is to write an empirical research paper. I expect this to read like a journal article and encourage you to make use of typesetting software for scientific articles such as LaTex. You will be graded on content and

methodology, but also on the quality of your final presentation. You need to seek approval from me for your choice of paper to discuss and for research plan as soon as possible.

The final grade will be based on performance in four areas:
1) **homework 25%**
2) **paper discussion 15%**
3) **final paper 40%**
4) **presentation of final paper 20%**

If you do not turn in the assignment by the deadline, you will not receive any credit. To receive credit on your assignment you need to present your work neatly, and clearly.

Useful Textbooks:
F. Canova, *Methods for Applied Macroeconomic Research,* Princeton University Press.

J. Durbin and S.J. Koopman, *Time Series Analysis by State Space Methods*, Oxford University Press.

J. Hamilton, *Time Series Analysis,* Princeton University Press.

W. Greene, *Econometric Analysis*, Prentice Hall.

You are not required to purchase a textbook for this class. I have asked the bookstore to order Canova's text because that is the one that touches on all of the topics we shall discuss. However, I will be providing lecture notes on the topics discussed in class. The textbooks above are useful for general reference purposes. At first reading, the textbooks listed above might appear unnecessarily complex, but you will go back to them again, and again, as your understanding of time-series techniques evolves.

Tentative Course Outline

Theory ahead of measurement: Dynamic Stochastic General Equilibrium Models
Setting up the basic RBC model
Log-linearization
Calibration
Solution methods for linear models
Impulse response functions
Tools for model solving: Dynare, AIM.
Models with nominal rigidities for the analysis of monetary policy

Related Papers:
Finn E. Kydland and Edward Prescott, "Time to Build and Aggregate Fluctuations,"
Econometrica, Vol. 50, No. 6, 1982, pages 135—1370.

*Jeremy Greenwood, Zvi Hercowitz, and Per Krusell, "Long-Run Implications of Investment-Specific Technological Change," *The American Economic Review*, Vol. 87, No. 3, 1997, pages 342—362.

Tack Yun, "Nominal Price Rigidity, Money Supply Endogeneity, and Business Cycles," *Journal of Monetary Economics,* vol. 37, pp. 345-370.

*Lawrence Christiano, Martin Eichenbaum, and Charles Evans, "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy," *Journal of Political Economy*, Vol. 113, No. 1, Pages 1—45.

Preliminaries: Univariate Time Series Models and Diagnostics
Definition of stationarity
ARMA processes, definition and estimation
Monte Carlo Experiments
The correlogram
Box-Jenkins model selection
Invertibility
Diagnostic tests for residuals
ARIMA processes
Unit root tests

VARs
Estimation of unidentified systems
Bootstrapping and the construction of confidence intervals
VARMA processes and invertibility
Impulse response functions
Identification schemes
       Orthogonal diagonalization
       Long-run restrictions
       Sign restrictions

Related Papers:
*Lutz Kilian, "Small-Sample Confidence Intervals for Impulse Response Functions," *Review of Economics and Statistics*, 1998, Vol. 80, No 2, Pages 218—230.

*Lutz Kilian, "Not All Oil Price Shocks Are Alike: Disentangling Demand and Supply Shocks in the Crude Oil Market," 2009, *American Economic Review*, Vol. 99, No. 3, Pages 1053—1069.

*Olivier Blanchard and Danny Quah, "The Dynamic Effects of Aggregate Demand and Supply Disturbances," *American Economic Review*, 1989, Vol. 79, No. 4, Pages 655—673.

Marco Lippi and Lucrezia Reichlin, "The Dynamic Effects of Aggregate Demand and Supply Disturbances: Comment," *American Economic Review*, 1993, Vol. 83, No. 3, Pages 644—652.

*Jordi Gali, "Technology, Employment, and the Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations?" *American Economic Review*, 1999, Vol. 89, No. 1, Pages 249—271.

*Jonas Fisher, "The Dynamic Effects of Neutral and Investment-Specific Technology Shocks," *Journal of Political Economy*, 2006, Vol. 114 No. 3, Pages 413—452.

*Luca Dedola and Stefano Neri, "What does a technology Shock Do? A VAR Analysis with Model-Based Sign Restrictions," *Journal of Monetary Economics*, 2007, Pages 512—549.

Method of moments
Instrumental Variables
GMM with continuous updating
Tests for weak instruments
Constructing confidence sets that are robust to weak instruments
Simulated Method of Moments

*Jordi Gali and Mark Gertler, "Inflation Dynamics: A Structural Econometric Analysis," *Journal of Monetary Economics*, 1999, Vol. 44, No. 2, Pages 195-222.

Frank Kleibergen and Sophocles Mavroeidis, "Weak Instrument Robust Tests In GMM and the New Keynesian Phillips Curve," *Journal of Business and Economic Statistics*, 2009, Vol. 27, No. 3

*Olivier Blanchard and Marianna Riggi, "Why are the 2000s so Different from the 1970s? A structural Interpretation of Changes in the Macroeconomic Effects of Oil Prices," Mimeo MIT (download from: http://econ-www.mit.edu/files/4733).

The Kalman Filter
Basic setup
Alternative initialization schemes
Estimation of ARMA processes
Filtering and Smoothing
Relationship to the HP filter
Estimation of dynamic stochastic general equilibrium models

Peter Ireland, "Technology Shocks in the New Keynesian Mode," Review of Economics and Statistics*, 2004, Vol. 86, No. 4, Pages 923—936.

*V.V. Chari, Patrick Kehoe and Ellen McGrattan, "Business Cycle Accounting," *Econometrica*, 2007, Vol 75, 781—836.

*Lawrence Christiano and Joshua Davis, "Two Flaws in Business Cycle Accounting", mimeo Northwestern University (see Christiano's web site: http://faculty.wcas.northwestern.edu/~lchrist/research/wedges/wedges1.pdf).

*Jesus Fernandez-Villaverde, Juan Rubio-Ramirez, Thomas Sargent, and Mark Watson, "ABCs (and Ds) of Understanding VARs", *American Economic Review*, 2007, Vol. 97, No. 3, Pages 1021—1026.

Bayesian Estimation
Introduction to Bayesian Estimation
Fundamentals of Bayesian Estimation
The Metropolis-Hastings Algorithm
Bayesian Estimation of DSGE models

Sungbae An and Frank Schorfheide, "Bayesian Analysis of DSGE Models", *Econometric Reviews*, 2007, Vol. 26, Pages 113-172 (download from: http://www.econ.upenn.edu/~schorf/papers/er-final.pdf).

*Frank Smets and Rafael Wouters, "Shocks and Frictions in U.S. Business Cycles: A Bayesian DSGE Approach," *American Economic Review*, 2007, Vol. 97, No. 3, Pages 586—606.

*Alejandro Justiniano and Giorgio Primiceri, "The Time-Varying Volatility of Macroeconomic Fluctuations," *American Economic Review*, 2008, Vol. 98, No. 3, Pages 604-641.