Economics 4201 and 6203
Applied Econometrics
Semester 1, 2011
T 2:00-5:00, ASB 216
Class Website:
http://research.economics.unsw.edu.au/jmorley/Courses/AppliedEconometrics.html

Syllabus

“If applied econometrics were easy, theorists would do it.” – Angrist and Pischke, Mostly Harmless Econometrics

Course Description

This course provides an introduction to econometrics as it is applied in macroeconomics. Emphasis is on hands-on implementation of the methods covered in the course. Topics include macroeconomic data; linear and nonlinear time series models; practical issues with likelihood-based inference for these models; computational approaches to hypothesis testing and model comparison; forecast evaluation; and structural identification.

Objectives

Two important objectives of this course are to survey the most widely used and useful methods for analyzing macroeconomic data and to provide insights into the practical issues and challenges in implementing these methods. However, the primary objective of the course is to stimulate interest in the application of time series econometrics to macroeconomic data, with the ultimate aim of helping students develop the necessary tools to conduct their own original research in empirical macroeconomics.

Prerequisites

The formal prerequisite is Econometric Methods (Econ2207/3291) or Elements of Econometrics (Econ4207) or Econometric Analysis (Econ6003). I will assume some familiarity with matrix algebra and introductory statistics and econometrics. To do well in the course, you will need the aptitude to learn quickly and work hard.

Requirements

Due to the advanced nature of the course material, attending lectures and participating in classroom discussions is essential to the learning process. Also, there will be five or six
homework assignments, a group presentation, and a take-home exam. The weights in determining your grade are given as follows:

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<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>5%</td>
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<tr>
<td>Homework Assignments</td>
<td>40%</td>
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<tr>
<td>Group Presentation</td>
<td>20%</td>
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<tr>
<td>Take-Home Exam</td>
<td>35%</td>
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The assignments and exam will require the use of econometrics software. Many standard methods can be implemented in EViews, which is a “canned” (i.e., relatively user friendly) econometrics package that is widely used for time series analysis. However, implementation of some of the methods requires programming. For this, we will use GAUSS, which has a free version (GAUSS lite) available. I will discuss how to access GAUSS lite in class. I will also provide guidance on programming in GAUSS.

Please note that late assignments will be penalized 20% of the total grade for each 24-hour period (or portion thereof) from the beginning of the class in which the assignment was due.

I encourage students to study together. However, for homework assignments and the take-home exam, you must write up your own answers in your own words. Evidence of copying on written work will be treated as a serious breach of academic integrity.

In terms of the group presentations, you will form teams to present a key article in the macroeconometrics literature. Depending on the paper, you will form teams of two or three people. Also, depending on the paper, you should try to replicate and/or update some of the empirical results in the paper. I will list potential papers on the class website. Prospective groups should consult with me about which paper they plan to present. I will discuss this in more detail early on in the semester.

Readings

Because the methods applied in econometrics are constantly changing, there is no single textbook that is able to serve as a reference for all of the material we will discuss in the course. Instead, I will collect together some readings (listed under topics below) from journal articles and chapters in textbooks. I will discuss the distribution of these readings in class.

Meanwhile, there is a recommended (but not required) textbook that provides a useful reference for the basic econometric theory needed in the course: A Guide to Econometrics, by Peter Kennedy, 2008. This should be available from the campus bookstore.

Topics

1. Time Series
   - Macroeconomic Data
   - Serial Correlation
   - Trends and Breaks
   - Methodology
(Readings: Stock and Watson, Ch. 12; Hansen, 2001; Hoover, 2001; Sims, 1996)

2. Basic Models
   • ARMA Processes
   • Seasonality
   • ARCH and GARCH
   • Single-equation multivariate models
   • VARs
(Readings: Stock and Watson, Ch. 12; Davidson and MacKinnon, Ch. 13)

3. Inference
   • Classical
     Maximum Likelihood Estimation
     The Kalman Filter
     Numerical Optimization
     Hypothesis Tests and Confidence Intervals
     Bootstrap Methods
   • Bayesian
     Priors and Posteriors
     Model Comparison
     Posterior Simulation
(Readings: Hamilton, Ch. 5; MacKinnon, 2006; Koop, Chs. 1-2; Greenberg, Ch. 7)

4. Forecasting
   • Loss Functions
   • Forecast Evaluation
(Readings: Hamilton, Ch. 4; Elliott and Timmermann, 2004; Diebold and Mariano, 1995)

5. Structural Analysis
   • Granger Causality
   • Cointegration
   • Impulse Response Functions
   • Timing/Sign Restrictions
   • Identification through Heteroskedasticity
   • The Lucas Critique
(Readings: Diebold, 1998; Granger, 2004; Stock and Watson, 14.4, 2001; Hamilton, 11.6; Blanchard and Quah, 1989; Gravelle, Kichian, and Morley, 2006)

6. Advanced Models*
   • Unobserved Components
   • Time-varying parameters
   • Markov switching
   • Threshold processes
   • Stochastic Volatility
*time permitting