

**Department of Resource Economics
University of Massachusetts
Fall 2008**

Res Ec 797A: Special Topics in Forecasting (The name of the course will be changed to Applied Univariate and Econometric Time-Series Techniques)

Instructor: Bernie Morzuch
213 Stockbridge Hall
Phone: 545-5718
email: morzuch@resecon.umass.edu

Office Hours: As you need or by appointment

Readings:

Applied Econometric Time Series by Walter Enders, Second Edition (Wiley). It is available at the Textbook Annex.

Prerequisites:

A graduate-level course in regression, knowledge of matrix algebra, and an intermediate-level ability in statistics are necessary.

Assignments:

There will be weekly assignments. These must be done in a timely fashion. The purpose of each assignment is to ensure that you are mastering and digesting the topics as they are being covered. Assignments will be worth 50% of your final grade.

Exams:

There will be two exams: a midterm (that is truly at the mid-term!) and a final exam. The final exam will concentrate on material covered since the midterm exam.

Each exam is worth 25% of your final grade. The midterm exam will be administered during a two-hour period outside of the normally-scheduled class period. The final exam will be scheduled during finals week.

Objectives:

I will attempt to do the following:

- (1) Summarize important quantitative forecasting techniques in use and the issues surrounding their use;
- (2) Discuss in detail some of the most important (though not necessarily the most widely used) techniques;
- (3) Develop the theory necessary to understand the techniques used.

This is not an econometric theory, statistical theory, or forecasting theory course. Forecasting is a pragmatic art. My goal is to have the course reflect this pragmatism.

Course Organization:

The material will be presented in a lecture format. Implementation of the appropriate computer software will be explained as we proceed through the lectures. You will not be required to make in-class presentations nor will you have to do a paper for this course.

Course Outline:

I will begin with background material on forecasting. This includes terminology, followed by simple and common univariate estimation procedures not found in Enders. I will provide you with readings that explain these univariate techniques in detail. I then move to several not-so-simple univariate methods. All of this paves the way for exploring the behavior of univariate time series and, in particular, testing for their stationarity. Half of the course (approximately 13 lectures) will be devoted to this background material and to univariate techniques.

Put on your seat belts for the next 13 lectures. We will be covering the topics in Enders presented below. Pick up the text and page through these readings. You may find them a bit frightening. I will attempt to lessen the difficulty by deciphering these pages for you. Enders is close to state-of-the-art regarding time-series econometrics.

During the last lecture, we address what happens to forecasts when we combine forecasts from different methods. We complete the course by comparing the forecasting performance of all of the techniques that we've studied through the semester.

Enders

- Difference equations: Chapter 1
- Stationary time-series models: Chapter 2
- Autoregressive conditional heteroscedasticity (ARCH): Chapter 3, pp. 112-145
- Testing for trends and unit roots: Chapter 4
 - Unit root processes, pp. 156-181
 - Unit root tests, pp. 181-229
- Multiequation time-series models: Chapter 5
 - Intervention analysis, pp. 240-247
 - Transfer function models, pp. 247-264
 - Vector autoregression, pp. 264-283
 - Granger causality, pp. 283-290
- Cointegration and error-correction models: Chapter 6
 - Cointegration, pp. 319-328
 - Error-correction models, pp. 328-339