Department of Resource Economics  
University of Massachusetts  
Fall 2015

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

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Office Hours: As you need me or by appointment

Readings:
. This is an old edition. I prefer this to the third and fourth editions.  
. I did not place an order for this text through Amazon.  
. Graduate students who previously took the course may still have the text.

. I did not place an order for this text through the Textbook Annex.  
. It is available through Amazon.  
. Graduate students who previously took the course may still have the text.  
. This text is ideal for presenting and explaining univariate time-series techniques at their most rudimentary level. It is a great background text.

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

Assignments:
There will be 10 or 11 assignments, each spaced approximately one week apart from the next. 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 are worth 50% of your final grade.

Exams:
There will be two exams: a midterm (currently scheduled for Wednesday, November 11 from 6:00 to 8:00 p.m.) and a final exam (to be scheduled after the last day of classes, which is December 11).

Each exam is worth 25% of your final grade. The final exam will concentrate on material covered since the midterm exam.
Objectives:
I will attempt to do the following:
(1) Summarize important time-series methodologies and 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 found in Newbold and Bos but not in Enders. We 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. This semester we have 26 class periods. Approximately half of the course (12 lectures) will be devoted to this background material and to univariate techniques.

For the remaining 14 lectures, we will be covering the topics in Enders presented below. When you 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, I would like to 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

Additional Texts

There are several additional texts out there that I like. I am mentioning two favorites directly below and why I like them. You are not responsible for these, but you might like to consult them in the future.


In terms of level of difficulty, this text is between Newbold and Bos’ text and Enders’ text, leaning more in the direction of Enders. It does a nice job explaining difficult topics without getting bogged down in cumbersome mathematics.


There has been an explosion in the literature on non-stationarity and unit roots during the past 30 years. This book takes the approach of discussing as many papers as possible in presenting developments in the literature on unit roots. It is meant for someone with background in this area. It is current, difficult, and complete!