

Econometrics 7801  
Spring 2012  
BUC 360, TH 9:00-10:20 am

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Office Hours: TH 10:30-11:00 am, TH 3:20-4:00

This course focuses on regression analysis, the widely used technique of statistical curve fitting that was introduced in Economics 7800. Econ 7800, or an equivalent background is a prerequisite. While 7800 focused on cross sectional data, this course concentrates on time series applications.

The successes and failures of the regression technique are illustrated by empirical problem sets making extensive use of the computer. The regression method can be generalized and extended to cover a variety of problems associated with time series data.

The computer work may use on any available machine, and any available software. Some possible statistics programs are Stata, Limdep, S-Plus, R, SAS, Shazam, RATS, Eviews, Excel and SPSS. My personal favorites are Eviews and Excel.

The text for this course is Walter Enders, **Applied Econometric Time Series**, 3<sup>rd</sup> edition. It may be purchased from the bookstore. Readings outside this text will also be assigned.

The grading scheme is:

Homework assignments	30%
Term project, Tuesday April 10 <sup>th</sup>	30%
Final examination, Thursday, May 3 <sup>rd</sup> 8:00 – 10:00 am	40%

Late papers lose points. The exam must be taken at the scheduled time. Incompletes are not generally given for nonmedical reasons. The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services (CDS), 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and me to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

The term project is to be an econometric project of the student's own design. It could be an exercise in applying econometric techniques to some economic, social or financial issue amenable to empirical testing. Alternatively, it might be a Monte Carlo study of some problem in econometric methodology. It must be a time series application.

Your final report should be typewritten and follow conventional footnoting and bibliographic rules. It should be about 8 pages long, double-spaced; papers more than 10 pages lose points. Your paper should briefly review the relevant literature. It should define measurable versions of the variables of interest and fit them into an econometric specification. It should apply appropriate estimation techniques, reporting the results clearly and concisely; please do not include raw computer output. Finally, it should discuss the inferences that are justified from your results

The written version of your project is due on April 10<sup>th</sup>. During the last three weeks of the semester the students will take turns orally presenting their research; plan a 10-minute presentation of your project. Dates will be arranged in class.

## Topic Outline and Reading List

### 1. Introduction and review

theories, data and statistical proof  
 functional form, dummy variables and distributed lags  
 six assumptions  
 bias, consistency and ordinary least squares (OLS)  
 the normality assumption  
 large samples and asymptotic normality  
 highly persistent time series  
 difference equations

Enders, chapter 1

Jeffrey Wooldridge, **Introductory Econometrics**, chapters 10, 11 and Appendix E

Peter Kennedy, **A Guide to Econometrics**, chapter 2

Peter Kennedy, "Sinning in the basement: what are the rules? Ten commandments of applied econometrics," **Applied Econometrics**, 2002: 569-589

(optional) Kiefer, David, **Macroeconomic Policy and Public Choice**, Springer-Verlag, 1999, chapter 7.

### 2. Time-series models

autoregressive models (AR)  
 moving average models (MA)  
 autocorrelation and partial autocorrelation  
 model selection criteria  
 maximum likelihood estimation  
 autoregressive conditional heteroscedastic models  
 seasonality

Peter Kennedy, **A Guide to Econometrics**, chapter 17

Enders, chapters 2 and 3

William H. Greene, **Econometric Analysis**, chapter 22

(optional) Russell Davidson and James G. MacKinnon, **Econometric Theory and Methods**, chapter 13

### 3. Generalized errors: autocorrelation

nonspherical disturbances and generalized least squares (GLS)  
 time-series data and autocorrelated disturbances  
 inefficiency of OLS  
 tests for autocorrelation  
 robust inference  
 GLS when  $\mathbf{W}$  is known, or unknown  
 autoregressive conditional heteroskedasticity (ARCH)

Jeffrey Wooldridge, **Introductory Econometrics**, chapter 12

Peter Kennedy, **A Guide to Econometrics**, chapter 8

4. Non-stationary time series
  - spurious regression
  - unit root testing
  - Monte Carlo methods
  - cointegration and error correction models
  - forecasting

Enders, chapter 4 and 6  
 Jeffrey Wooldridge, **Introductory Econometrics**, chapter 18  
 (optional) Russell Davidson and James G. MacKinnon, **Econometric Theory and Methods**, chapter 14
  
5. Multiequation models
  - simultaneity bias
  - identification of structural parameters
  - instrumental variables and two-stage least squares
  - vector autoregression
  - Granger causality

Enders, chapter 5  
 Jeffrey Wooldridge, **Introductory Econometrics**, chapter 16  
 Peter Kennedy, **A Guide to Econometrics**, chapter 11  
 C. A. Sims, "Macroeconomics and Reality," **Econometrica** 48, 1980: 1-48  
 Hall, S. et al., "Testing Causality Between Team Performance and Payroll: The Cases of Major League Baseball and English Soccer," **Journal of Sports Economics** 3, 2002: 149-168
  
6. State space and the Kalman filter
  - observed and unobserved variables
  - Bayesian interpretation
  - one-step and smoothed Kalman forecasts
  - time-varying parameters

James D. Hamilton, **Time Series Analysis**, chapter 13
  
7. Review and conclusion