Econometrics 7801
Fall 2016
M Li 1160, TH 2:00—3:20

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This course focuses on regression analysis, the widely used technique of statistical curve fitting that was introduced in of 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 favorite is R.

The text for this course is Walter Enders, **Applied Econometric Time Series**, 4th 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, Thursday, November 17th	40%
Final examination, Tuesday, December 13 1:00 3:00	30%

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 November 17th; it should include a short (about 5 slides) Powerpoint presentation that I will post on the class website. 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

   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

2. Time-series models

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

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

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 Λ 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 10
   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