

EC 572/472 Time Series Analysis and Forecasting

Winter 2012, 6:40-8:30pm TTH (CH-307)

[Prof. K.-P. Lin](#) (CH 241G, 725-3931)

Office Hours: 3:30-4:30 TTH & by appointment

This course covers the methodology and applications of econometric time series analysis and forecasting, with focus on issues and problems of predicting the U.S. economy.

Basic understanding of econometric analysis is required (EC 469, 570 or equivalent). Knowledge of calculus, algebra, probability theory and statistics are essential for this course. Familiar with computer programming and econometric packages will be useful. Stata will be used throughout the course.

Texts and Software

- Required:
 - [W. Enders](#), *Applied Econometric Time Series*, 3rd ed., Wiley, 2010.
 - Stata 11, [StataCorp](#), 2010. A version of Small Stata may be used for the class. You can order it through Stata Course GradPlan [here](#).
- Recommended:
 1. T. S. Tsay, *Analysis of Financial Time Series*, 3rd ed, Wiley, 2010.
 2. W. H. Greene, *Econometric Analysis*, 7th ed., Part V: Time Series and Macroeconometrics, Prentice Hall, 2011.
 3. C. F. Braum, *An Introduction to Modern Econometrics Using Stata*, Stata Press, 2006.

Topics

1. Reviews of Basic Econometrics
 - a. Simple and Multiple Regression
 - b. Model Evaluation
 - c. Model Selection Criteria
2. [Least Squares Prediction](#)
 - a. Forecasting with Classical Regression Models
 - b. Forecasting with Autocorrelation
 - c. Forecasting with Lagged Dependent Variable
 - d. Forecast Error Statistics and Evaluation
3. [Time Series Analysis I: Introduction](#)
 - a. Covariance Stationarity
 - b. Trend in Time Series
 - c. Unit Root Problem: Estimation and Testing
4. [Time Series Analysis II: ARIMA Models](#)
 - a. Identification
 - b. Estimation and Diagnostic Checking
 - c. Forecasting
 - d. Extension: Transfer Function Models
5. [Time Series Analysis III: Advanced Topics](#)
 - a. ARMA Analysis of Regression Residuals
 - b. ARCH and GARCH Model Estimation
 - c. Multi-Equation Time Series Models

Case Study and Homework

Expectation

1. There will be a mid-term (February 16, in class) and a final exam (March 20, 7:30pm). In addition, 3 or 4 homeworks will be assigned periodically (due every 2 weeks in average).
2. A course project is required for graduate students taking this course EC572. The project model constructed must be capable of performing (structural) econometric and time series forecasts. A good source of data is [Economagic.com: Economic Time Series Page](http://Economagic.com). Here are some examples you could consider for the course project:
 - a. Unemployment, inflation, and growth
 - b. Productivity, wage, and employment
 - c. Price indexes (CPI, PPI, etc.)
 - d. NYSE, Dow-Jones, and Standard Poor's indexes
 - e. Term structure of interest rates
 - f. Government deficit
 - g. Trade balance and strong/weak dollars
3. For graduate students taking EC572, a one-page project proposal is due on or before March 1 for approval. Final report of the project is then due on or before March 20.
4. Grade distribution of this course looks like this:

	EC472	EC572
Mid-Term	40%	30%
Final	40%	30%
Project		20%
Homeworks	20%	20%