Spring 2016

ECON 475

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Recommended Citation
Scrimgeour, Dean, "ECON 475" (2016). Faculty Syllabi. Paper 53.
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ECONOMICS 475: SEMINAR IN ECONOMETRICS SYLLABUS

Description: The Seminar in Econometrics covers econometrics at a more advanced level than Econ 375 (Applied Econometrics). This version of the Seminar in Econometrics covers forecasting economic time series. The class will cover a variety of topics from the following: forecast evaluation; model selection; forecast combination; multistep forecasts; exponential smoothing; trend-cycle-seasonal decompositions; serial correlation; univariate time series models (ARIMA models); non-stationarity time series; vector autoregression; cointegration; time-varying volatility; structural change.

Objectives: Students will learn appropriate econometric techniques for forecasting economic time series. Students will develop their research skills (especially empirical analysis and writing) by completing a research project in which they create a forecasting model for a particular economic time series.

Class Hours: Tuesdays 7-9.30pm
Instructor: Dean Scrimgeour
Office: 216 Persson Hall
Office Hours: Mondays 10-12 and Wednesdays 10-11 or by appointment.
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Prerequisite: Econ 375 (Applied Econometrics), Econ 378 (Mathematical Economics)
Reading

Required Texts:

1. Francis X Diebold, *Forecasting in Economics, Business, Finance and Beyond*, 2015, Department of Economics, University of Pennsylvania


Recommended Texts: The following are good for background reading on econometrics and prediction:


3. Rob J Hyndman and George Athanasopoulos, *Forecasting: Principles and Practice*, OTexts, 2013 (available for free online, or for purchase offline)


In addition, we will discuss several other readings during the semester.
Requirements

60 Forecasting Project.

5 Proposal: a one-page statement of the intended research project. This must be adequate before any further steps. Resubmission may be required if: data availability is not clear, no outturns in the golden window, or instructor deems the topic too boring.

10 Presentation of data: a written and oral presentation of the series you are forecasting.

25 Forecasting Report: a (professional-quality) report presenting your findings, normally no more than 20 pages.

10 Oral presentation: an oral presentation of the report.

5 Evaluation: A one-page reflection on the research project in light of newly-released data.

5 Code.

10 Paper presentation: each student will present a paper (written by someone else, likely selected from the list of references in this syllabus) in class.

10 Forecast scavenger hunt: each student will supply a dataset that consists of one or more forecasts of an economic time series as well as the series itself.

10 Forecast evaluation: each student will evaluate the forecast supplied by another student in the scavenger hunt.

10 Active participation in class.
Outline

The course will be a mix of lecture, student presentations, computer exercises, some problem sets, and whatever else seems right.

1. Context and principles of forecasting (Diebold ch1 ch2)

2. Review of theory of regression (serial correlation testing, correction; quantile regression; Diebold ch3 ch4)

3. Model selection and regularization (cross-validation, information criteria, testing, lasso, lars, ridge regression, dynamic factor models; Diebold ch5)

4. Forecast comparison and combination (Diebold-Mariano; Diebold, 1998)

5. Exponential smoothing

6. ARMA models (impulse reponse function, correlogram, Box-Jenkins)

7. Nonstationarity (unit roots, testing)

8. Trends, cycles and seasonality (spurious regression, cointegration, error correction; Diebold ch6)

9. Structural change (means, slopes)

10. Vector autoregression (Nonstructural, Recursive; impulse response function, variance decomposition; Granger causality; Stock and Watson, 2001, Diebold ch10)

11. Time-varying volatility (ARCH, GARCH; Engle, 2001, Diebold ch11)

12. Nonlinear dynamics (regime switching; threshold autoregression)
References


