Spring 2016

ECON 475

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Department of Economics
Colgate University

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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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Website: sites.google.com/a/colgate.edu/econ475
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
2. Nate Silver, *The Signal and the Noise: Why So Many Predictions Fail – but Some Don't*, Penguin, 2015

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

1. Walter Enders, *Applied Economic Time Series*, Wiley, 2nd Edition, 2004
2. Gloria Gonzalez-Rivera, *Forecasting for Economics and Business*, Pearson, 2013
3. Rob J Hyndman and George Athanasopoulos, *Forecasting: Principles and Practice*, OTexts, 2013 (available for free online, or for purchase offline)
4. Daniel Kahneman, *Thinking, Fast and Slow*, Farrar, Strauss, Giroux, 2011
5. Philip Tetlock, *Expert Political Judgement*, Princeton University Press, 2009
6. Philip Tetlock and Dan Gardner, *Superforecasting: The Art and Science of Prediction*, Crown, 2015,
7. Jeffrey Wooldridge, *Introductory Econometrics: A Modern Approach*, Cengage, 5th Edition, 2012

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

Nikolaos Askitas and Klaus F. Zimmermann. Nowcasting business cycles using toll data. *Journal of Forecasting*, 32(4):299–306, 2013.

Christiane Baumeister, Lutz Kilian, and Xiaoqing Zhou. Are product spreads useful for forecasting? an empirical evaluation of the verleger hypothesis. 2013.

Giorgio Bodo, Roberto Golinelli, and Giuseppe Parigi. Forecasting industrial production in the euro area. *Empirical Economics*, 25(4):541–561, 2000.

Karl E Case and Robert J Shiller. Forecasting prices and excess returns in the housing market. *Real Estate Economics*, 18(3):253–273, 1990.

Yu-Chin Chen, Kenneth S Rogoff, and Barbara Rossi. Can exchange rates forecast commodity prices? *Quarterly Journal of Economics*, 125(3):1145–1194, 2010.

Walter Enders and Todd Sandler. Transnational terrorism 1968-2000: Thresholds, persistence, and forecasts. *Southern Economic Journal*, pages 467–482, 2005.

Massimo Guidolin, Stuart Hyde, David McMillan, and Sadayuki Ono. Non-linear predictability in stock and bond returns: When and where is it exploitable? *International Journal of Forecasting*, 25(2):373–399, 2009.

Lutz Kilian and Bruce Hicks. Did Unexpectedly Strong Economic Growth Cause the Oil Price Shock of 2003-2008? *Journal of Forecasting*, 32(5):385–394, 2013.

Alan L Montgomery, Victor Zarnowitz, Ruey S Tsay, and George C Tiao. Forecasting the US unemployment rate. *Journal of the American Statistical Association*, 93(442):478–493, 1998.

Glenn D Rudebusch and John C Williams. Forecasting recessions: the puzzle of the enduring power of the yield curve. *Journal of Business & Economic Statistics*, 27(4), 2009.

James H Stock and Mark W Watson. Forecasting inflation. *Journal of Monetary Economics*, 44(2):293–335, 1999.

James H Stock and Mark W Watson. Forecasting output and inflation: The role of asset prices. *Journal of Economic Literature*, 41:788–829, 2003.

Peter M Summers. Forecasting Australia's economic performance during the Asian crisis. *International Journal of Forecasting*, 17(3):499–515, 2001.