Econometric Theory
LUISS - Mosec
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Contact Information

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Class

W 08.00 - 9.30; Th 14.30 - 16.00; Th 14.00 - 15:30

Course Objectives

The course provides an introduction to time series methods in econometrics with applications in Macroeconomics and Forecasting. Topics include univariate and multivariate autoregression (AR and VAR) models, filtering, structural VARs, Bayesian VAR and econometrics of big data.

Assignments and grading

We consider a grade from 0 to 30. You will be request to work on 4 problem sets, which you are asked to replicate academic papers and perform empirical analysis using methodologies covered during the lessons. If you pass the assignment, you get 0.25 point for the final mark, if you well execute it you get 0.5 point. You can obtain 1 extra point on the final grade if you pass all the 6 problem sets. We encourage you to solve the assignments in group (max. 5 students), but you have to submit an individual final report, indicating the group's members.

Tentative course outline

- **19/02**, **20/02**. Introduction to time series and descriptive statistics.

- **26/02**, **27/02**, **5/03**, *06/03*. Forecasting and stationary time series, Wold decomposition, autoregressive and moving average models.
  Problem set 1. 05/03 – 13/03.

- **12/03**, **13/03** and *13/03*. Spectral analysis.
  Problem set 2. 13/03 – 20/03.

- **19/03**, **20/03**, **26/03**, **27/03**. Vector autoregressive process.
  Problem set 3. 20/03 – 31/03.

- **02/04**, **03/04**. Structural vector autoregressive process.

- **09/04**, **10/04**, **16/04**,**17/04**, **23/04**, **24/04**, **30/04**. Bayesian vector autoregressive process and prior selection.
  Problem set 4. 24/04 – 30/04

- **7/05** and *8/05*. Econometrics of big data.
  Problem set 5. 8/05 – 14/05

- **14/05** and **15/05** TBD

Exams

- TBA

- TBA

Textbook and readings

Textbook

- J.D. Hamilton. *Time Series Analysis*. Princeton University Press, 1994

- P.J. Brockwell and R.A. Davis. *Time Series: Theory and Methods*. Springer series in statistics. Springer, 1986

- A. Zellner. *An introduction to Bayesian inference in econometrics*. Wiley series in probability and mathematical statistics: Applied probability and statistics. J. Wiley, 1971

Descriptive statistics

- Finn E. Kydland and Edward C. Prescott. Business cycles: real facts and a monetary myth. *Quarterly Review*, (Spr):3–18, 1990

Forecasting, autoregressive and moving average models

- Olivier Blanchard and John Simon. The long and large decline in u.s. output volatility. *Brookings Papers on Economic Activity*, 32(1):135–174, 2001

- Massimiliano Marcellino, James Stock, and Mark Watson. A comparison of direct and iterated multistep ar methods for forecasting macroeconomic time series. Technical report, 2005

Spectral analysis

- C.W.Granger. The typical spectral shape of an economic variable. *Econometrica*, 34(1):150–161, 1966

- Marianne Baxter and Robert G. King. Measuring business cycles: Approximate band-pass filters for economic time series. *The Review of Economics and Statistics*, 81(4):575–593, November 1999

Vector autoregressive process

- Christopher A Sims. Macroeconomics and reality. *Econometrica*, 48(1):1–48, January 1980

- James H. Stock and Mark W. Watson. Vector autoregressions. *Journal of Economic Perspectives*, 15(4):101–115, Fall 2001

- Lawrence J. Christiano, Martin Eichenbaum, and Charles L. Evans. Monetary policy shocks: What have we learned and to what end? In J. B. Taylor and M. Woodford, editors, *Handbook of Macroeconomics*, volume 1 of *Handbook of Macroeconomics*, chapter 2, pages 65–148. Elsevier, 1999

- Olivier Jean Blanchard and Danny Quah. The dynamic effects of aggregate demand and supply disturbances. *American Economic Review*, 79(4):655–73, September 1989

- Jordi Gali. Technology, employment, and the business cycle: Do technology shocks explain aggregate fluctuations? *American Economic Review*, 89(1):249–271, March 1999

- Robert G. King, Charles I. Plosser, James H. Stock, and Mark W. Watson. Stochastic trends and economic fluctuations. *American Economic Review*, 81(4):819–40, September 1991

- Martin Lettau and Sydney C. Ludvigson. Understanding trend and cycle in asset values: Reevaluating the wealth effect on consumption. *American Economic Review*, 94(1):276–299, March 2004

- Christopher A Sims, James H Stock, and Mark W Watson. Inference in linear time series models with some unit roots. *Econometrica*, 58(1):113–44, January 1990

- Lutz Kilian. Structural vector autoregressions. CEPR Discussion Papers 8515, C.E.P.R. Discussion Papers, August 2011

Bayesian vector autoregressive process

- Thomas Doan, Robert B. Litterman, and Christopher A. Sims. Forecasting and conditional projection using realistic prior distributions. *Econometric Reviews*, 3:1–100, 1984

- K Rao Kadiyala and Sune Karlsson. Numerical methods for estimation and inference in bayesian var-models. *Journal of Applied Econometrics*, 12(2):99–132, March-Apr 1997

- John C. Robertson and Ellis W. Tallman. Vector autoregressions: forecasting and reality. *Economic Review*, (Q1):4–18, 1999

- Harald Uhlig. What are the effects of monetary policy on output? results from an agnostic identification procedure. *Journal of Monetary Economics*, 52(2):381–419, March 2005

- Sune Karlsson. Forecasting with bayesian vector autoregressions. Working Papers 2012:12, rebro University, School of Business, August 2012

Econometrics of big data

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

- Ben Bernanke, Jean Boivin, and Piotr S. Eliasz. Measuring the effects of monetary policy: A factor-augmented vector autoregressive (favar) approach. *The Quarterly Journal of Economics*, 120(1):387–422, January 2005