Econ 482

Time Series Methods

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1. Contact information

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2. General description and information about the course

This is a course on empirical macroeconomics/applied time series, with a focus on Bayesian methods to conduct inference in macro-econometric models. The emphasis on Bayesian inference is motivated by the increased popularity of this methodology, which is gradually becoming the dominant paradigm in macro/time-series empirical work. Topics include Bayesian methods for prediction with big data and large information sets, vector autoregressions (VARs), structural VARs, state-space models, time-varying parameters and stochastic volatility models, estimation of linear and nonlinear dynamic stochastic general equilibrium (DSGE) models, model comparison and model choice.

A substantial part of the course will be based on papers. The references closest to the material covered in class are the survey article by Del Negro and Schorfheide (2011) and (especially during the second part of the course) the books by DeJong and Dave (2011) and Herbst and Schorfheide (2015). Other good references are (in order of relevance for our class): Canova (2007), Bauwens et al. (1999), Geweke (2005) and Gelman et al. (2004) (although Gelman et al. (2004) does not focus on time series applications). An always useful reference is Hamilton (1994) (which, hopefully, you have already bought at some point of your graduate studies).

We meet twice a week (Tuesday and Thursday, 11:00–12:50pm) in room KGH 1410.

Evaluation will be based on homeworks and a final take home exam.

3. Approximate plan of the course and reading list

Introduction to Bayesian inference
- Geweke (2005)
- Bauwens et al. (1999)
- Gelman et al. (2004)

Bayesian analysis of linear Gaussian models
- Geweke (2005)
- Bauwens et al. (1999)
- Gelman et al. (2004)
- Hamilton (1994)

Prediction with big data and large information sets
- Hastie et al. (2015), ch. 1 and 2
- Park and Casella (2008)
- Giannone et al. (2018)

Inference in AR models and the "unit root controversy"
- Sims and Uhlig (1991)
- Bauwens et al. (1999)

Vector autoregressions
- Hamilton (1994)
- Canova (2007)

Priors for vector autoregressions
- Doan et al. (1984)
- Kadiyala and Karlsson (1997)
- Sims and Zha (1998a)
- Karlsson (2013)
- Banbura et al. (2010)
- Giannone et al. (2015)
- Giannone et al. (2017)

Structural VARs
- Christiano et al. (1999)
- Stock and Watson (2001)
- Blanchard and Quah (1989)
- Uhlig (2005)
- Rubio-Ramirez et al. (2010)
- Sims and Zha (1998b)

Identification and the effect of monetary, technology and fiscal shocks
Christiano et al. (1999)
Gali (1999)
Christiano et al. (2004)
Francis and Ramey (2005)
Fisher (2006)
Blanchard and Perotti (2002)
Ramey (2011)

Monte carlo integration
Gelman et al. (2004)
Bauwens et al. (1999)
Geweke (2005)

State-space models and the Kalman filter
Hamilton (1994)
Kim and Nelson (1999)
DeJong and Dave (2011)

Time-varying parameters and stochastic volatility models
Kim and Nelson (1999)
Carter and Kohn (1994)
Kim et al. (1998)
Primiceri (2005)

The Great Inflation and the Great Moderation through the lens of SVARs
Clarida et al. (2000)
Sims and Zha (2006)
Primiceri (2005)
Cogley and Sargent (2005)
Benati and Surico (2009)

Inference in DSGE models
An and Schorfheide (2007)
DeJong and Dave (2011)
Herbst and Schorfheide (2015)
Smets and Wouters (2007)

Sources of business cycle fluctuations in the US economy
Prescott (1986)
Smets and Wouters (2007)
Justiniano et al. (2010)

Justiniano et al. (2011)
Christiano et al. (2014)

Model comparison and model choice
Gelman et al. (2004)
Kass and Raftery (1995)
Geweke (1998), section 4
Chib (1995)
Smets and Wouters (2007)

Nonlinear DSGE models and the particle filter
Fernandez-Villaverde and Rubio-Ramirez (2007)
Pitt and Shephard (1999)
Herbst and Schorfheide (2015)

References

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Banbura, M., D. Giannone, and L. Reichlin (2010): "Large Bayesian VARs," *Journal of Applied Econometrics*, 25(1), 71–92.

Bauwens, L., M. Lubrano, and J.-F. Richard (1999): *Bayesian Inference in Dynamic Econometric Models*, Oxford: Oxford University Press.

Benati, L. and P. Surico (2009): "VAR Analysis and the Great Moderation," *American Economic Review*, 99(4), 1636–52.

Blanchard, O. J. and R. Perotti (2002): "An Empirical Investigation of the Dynamic Effect of Shocks to Government Spending and Taxes on Output," *The Quarterly Journal of Economics*, 117-4, 1329–1368.

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Chib, S. (1995): "Marginal Likelihood from the Gibbs Output," *Journal of the American Statistical Association*, 90, 1313–1321.

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Christiano, L. J., R. Motto, and M. Rostagno (2014): "Risk Shocks," *American Economic Review*, 104, 27–65.

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Fisher, J. D. M. (2006): "The Dynamic Effect of Neutral and Investment-Specific Technology Shocks," *Journal of Political Economy*, 114(3), 413–451.

Francis, N. R. and V. A. Ramey (2005): "Is the Technology-Driven Real Business Cycle Hypothesis Dead? Shocks and Aggregate Fluctuations Revisited," *Journal of Monetary Economics*, 52(8), 1379–1399.

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——— (2018): "Economic Predictions with Big Data: The Illusion of Sparsity," Mimeo, Northwestern University.

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