

DIW Masterclass on Bayesian Estimation of DSGE Models

Instructor:

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Dates: 30/31 Oct

Summary: The lectures will discuss recent advances in the literature on the econometric analysis of Dynamic Stochastic General Equilibrium (DSGE) models, covering both methods and applications. We begin with an introduction to Bayesian inference. We proceed with the estimation of linearized as well as nonlinear DSGE models and review algorithms to generate draws from the posterior distribution of DSGE model parameters. Once these parameter draws are obtained the DSGE models can be used to provide quantitative answers to a variety of questions, e.g. about the sources of business cycle fluctuations, relative importance of endogenous propagation mechanisms, the effects of monetary and fiscal policy interventions. We present tools to evaluate the fit of DSGE models, review the forecasting performance of estimated DSGE models, and discuss novel methods of incorporating external information (about the current state of the economy and the long-run outlook) into DSGE model forecasts. The lectures are supplemented by practical MATLAB homework exercises that illustrate how to implement the estimation methods.

Lecture 1 (90min): Introduction to Bayesian Inference; Introduction to DSGE Modeling

Lecture 2 (90min): MCMC Methods for DSGE Models; A Prototypical Application

Lecture 3 (90min): Sequential Monte Carlo Methods; Nonlinear Filtering for DSGE Models

Lecture 4 (90min): Evaluating DSGE Models; Forecasting with DSGE Models

Reading List:

Marco Del Negro and Frank Schorfheide (2011): "Bayesian Macroeconometrics," in J. Geweke, G. Koop, and H. van Dijk (eds): *The Oxford Handbook of Bayesian Econometrics*, Oxford University Press.

Preliminary version: http://www.ssc.upenn.edu/~schorf/papers/bayesian_macro.pdf

Marco Del Negro and Frank Schorfheide (2013): "DSGE Model-Based Forecasting," in G. Elliott and A. Timmermann (eds.): *Handbook of Economic Forecasting*, Vol 2A, 2013, Handbooks in Economics, Elsevier / North-Holland, 57-140.

Preliminary version: http://www.ssc.upenn.edu/~schorf/papers/hb_forecasting.pdf

Ed Herbst and Frank Schorfheide (2013): "Sequential Monte Carlo Sampling for DSGE Models," *Journal of Applied Econometrics*, forthcoming.

Preliminary version: http://www.ssc.upenn.edu/~schorf/papers/smc_paper.pdf