Estimation of DSGE Models

Instructor: Taeyoung Doh; Federal Reserve Bank of Kansas City (dohtyoung@gmail.com)

Summary: This lecture focuses on the estimation of dynamic stochastic general equilibrium (DSGE) models using the likelihood-based approach. We study how to construct the state-space representation of a DSGE model based on the approximate solution and how to evaluate the likelihood function given the state-space representation. Bayesian approach of combining the likelihood function with a prior will be explained. A prototypical real business cycle model will be used as a benchmark example. The application to a New Keynesian DSGE model will be discussed if time allows.

Prerequisites: It is assumed that students are familiar with advanced level undergraduate econometrics and macroeconomics at the minimum. Prior knowledge of maximum likelihood estimation of autoregressive models and optimizing DSGE models is expected. Understanding of the state-space representation and the Kalman filter is helpful but not required.

Goals: Students will acquire the technical skills to estimate DSGE models based on the approximate solution.

Outline

- A Prototypical DSGE Model

- State-space Representation of a DSGE Model

- The Construction of the Likelihood Function of a Linearized DSGE Model

- Simulation-Based Bayesian Inference for DSGE Models

- Extension

Readings

- An, Sungbae and Frank Schorfheide (2007):"Bayesian Analysis of DSGE Models," *Econometric Reviews*, **26**(2-4) 113-172.

- Del Negro, Marco and Frank Schorfheide (2010):"Bayesian Macroeconometrics,"(Chapter 4) *Manuscript*, University of Pennsylvania. (http://economics.sas.upenn.edu/ schorf/research.htm)

General References

- Hamilton, James (1994): *Time Series Analysis*, Princeton University Press.

- Geweke, John (2005):*Contemporary Bayesian Econometrics and Statistics*,John Wiley and Sons, Hoboken.