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AMG

Estimation and Solution of DSGE Models: Application to Labor Search Models

Place: t.b.d.

Time: t.b.d.

The course is based on techniques and applications and explores the importance of the labor market in macroeconomics using a variety of methodological tools. It is designed to develop and sharpen students' prior knowledge dynamic macroeconomics and econometrics with a mixture of lectures on state-of-the-art solution and estimation techniques for macroeconomic models and application of the techniques to search theory with standard software packages and models from the literature.

Course Outline

1. Introduction

Concepts/techniques:	Data filtering, DSGE linearized difference equations
Main readings:	King and Rebelo (1993), Shimer (2005), Uhlig (1997) sec. 3
Additional reading:	Hamilton (1994) ch. 1

2. Baseline Search and Matching Model

Concepts/techniques:	Intertemporal optimization, search and matching
Reading:	Merz (1995)

2. Root Finding Methods, Linear Solution Methods

Concepts/techniques:	Bisection, Newton-based methods, eigenvalue methods
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Reading:	Judd (1998) ch. 5, Uhlig (1997) sec. 6 and 7
Additional readings:	Fernández-Villaverde (2010) sec. 4.1

3. State Space and Likelihood Function

Concepts/techniques:	Kalman filter, likelihood function
Main reading:	Fernández-Villaverde (2010) sec. 4.2
Additional reading:	Hamilton (1994) ch. 13.2 and 13.4

5. Estimation Methods and Model Analysis

Concepts/techniques:	Maximum likelihood, Bayesian methods, Markov Chain Monte Carlo, Diagnostics, Model Comparison
Main reading:	Fernández-Villaverde (2010) sec. 4 and 5
Additional reading:	An and Schorfheide (2007) sec. 3 and 4

6. Nonlinear Methods

Concepts/techniques:	Perturbation, Particle Filter
Main reading:	Fernández-Villaverde (2010) sec. 4.2.2 and An and Schorfheide (2007) sec. 6
Additional reading:	Lan and Meyer-Gohde (2013), Schmitt-Grohé and Uribe (2004)

Literature

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

Canova, Fabio. *Methods for Applied Macroeconomic Research*. 2007.

DeJong, David N. with Chetan, Dave. *Structural Macroeconomics*. 2007.

Fernández-Villaverde, Jesús (2010): "The Econometrics of DSGE Models," *SERIEs*, Spanish Economic Association, vol. 1(1), pages 3-49.

Hamilton, James. *Time Series Analysis*. 1994.

Judd, Kenneth. *Numerical Methods in Economics*. 1998.

King, Robert G. and Rebelo, Sergio T. (1993): "Low frequency filtering and real business cycles," *Journal of Economic Dynamics and Control*, vol. 17(1-2), pages 207-231.

Merz, Monika (1995): "Search in the Labor Market and the Real Business Cycle." *Journal of Monetary Economics*, 36(2): 269–300.

Shimer, Robert (2005): "The Cyclical Behavior of Equilibrium Unemployment and Vacancies." *American Economic Review*, 95(1): 25–49.

Uhlig, Harald (1997): "A Toolkit for Analyzing Nonlinear Dynamic Stochastic Models Easily," extended version:

<http://www2.wiwi.hu-berlin.de/institute/wpol/html/toolkit/toolkit.pdf>

Additional Literature

Fernández-Villaverde, Jesús, Pablo Guerron-Quintana, and Juan F. Rubio-Ramirez (2010): "The New Macroeconometrics: A Bayesian Approach," in A. O'Hagan and M. West ,eds., *Handbook of Applied Bayesian Analysis*. 2010.

Lan, Hong & Meyer-Gohde, Alexander (2013): "Solving DSGE models with a nonlinear moving average," *Journal of Economic Dynamics and Control*, vol. 37(12), pages 2643-2667.

Schmitt-Grohé, Stephanie & Uribe, Martin (2004): "Solving dynamic general equilibrium models using a second-order approximation to the policy function," *Journal of Economic Dynamics and Control*, vol. 28(4), pages 755-775.