

LASER Summer School
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Bayesian Inference in Macroeconomic Models
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1 Contact information

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2 General description and information about the course

The course aims to introduce students to the Bayesian estimation of three popular classes of macroeconomic models: (i) vector autoregressions (VAR and BVARs), (ii) models with time varying coefficients and stochastic volatility, and (iii) dynamic stochastic general equilibrium (DSGE) models.

VARs are very popular and flexible tools used for forecasting and the identification of economic shocks (SVARs). As such, they constitute a bridge between reduced-form and structural models. However, their flexibility comes at the cost of being very heavily parameterized. Bayesian inference becomes then crucial to handle the proliferation of parameters and to improve dramatically both their forecasting performance and the accuracy of estimation of more structural objects (e.g. impulse responses.)

Models with drifting coefficients and stochastic volatility have been extensively used to analyze the monetary history of the U.S. and other developed countries, trying to identify the causes of important events such as the Great Inflation or the Great Moderation. Moreover, these models seem very well suited to study the causes and consequences of the current financial crisis, which is characterized by abnormally high shock volatility and strong nonlinearities.

Finally, in recent years DSGE models have become the most popular tool for policy analysis in Central Banks. It is therefore important to understand how to

take these models to the data, evaluate their fit and, among other things, use DSGE models to extract counterfactual objects that are fundamental for the conduct of monetary policy, e.g. potential output and the natural rate of interest.

The following program outlines the structure of the course and provides a number of useful references.

3 Approximate plan of the course and reading list

Day 1

Introduction to Bayesian inference

Vector autoregressions

Hamilton (1994)

Bayesian vector autoregressions

Doan, Litterman, and Sims (1984)

Sims (2000)

Sims and Zha (1998)

Kadiyala and Karlsson (1997)

Banbura, Giannone, and Reichlin (2010)

Giannone, Lenza, and Primiceri (2010)

Day 2

Bayesian inference in DSGE models

An and Schorfheide (2007)

DeJong and Dave (2007)

Smets and Wouters (2007)

Cogley, Primiceri, and Sargent (2010)

Model comparison and model choice

Gelman, Carlin, Stern, and Rubin (2004)

Geweke (1998), section 4

Smets and Wouters (2007)

Sims (2003)

Day 3

Time varying parameters and stochastic volatility models

Kim and Nelson (1999)

Carter and Kohn (1994)
Kim, Shephard, and Chib (1998)
Cogley and Sargent (2005)
Primiceri (2005)

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