

EC 831: Empirical Methods in Macroeconomics

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DSGE Model Estimation with Metropolis-Hastings

We will estimate the DSGE model from An & Schorfheide (2007).

- The paper and data are on the website.

Linearized DSGE model:

- equations (24) to (26) and (29) to (31)

Take these equations and solve them using one of the "Solving Rational Expectations Models" methods

- This will give you the state equation of the state space model

Use equation (38) to get the measurement equations

Use the prior specification provided in Table 2 on page 129.

- This will involve writing a file that calculates the log of the pdf of the prior distributions
- We will assume that the prior distributions are independent, i.e. the joint log prior density is the sum of the individual log densities

Likelihood:

- Write a file that evaluates the log likelihood of the state space system using the Kalman filter
- This file will be very similar to the one you wrote for the last assignment. (If your code for the previous assignment was general enough then you won't have to change much at all!)

Before you start MCMC

Calculate the posterior mode

- This is the same idea as maximizing the log likelihood, but now you are maximizing the kernel of the log posterior (i.e. sum of log likelihood and log prior)
- Do this in the same way you did the numerical optimization for the last assignment (i.e. using `fminunc` or `fminsearch` etc.. in Matlab)
- Next calculate the hessian at the posterior mode

Use the Random-Walk Metropolis Hastings algorithm

- Follow the directions in the class notes
- Run a few preliminary runs to find c so that your acceptance is roughly 25

Report the posterior mean, mode and 5th and 95th percentiles in a table for all the parameters.