

## VAR EXERCISE

The course web site has data on the federal funds rate (`ffr`), the M1 money stock (`m1`), the price level (`cpi`), and industrial production (`ip`), both as an **R** time series object in `rmpy.R` and as a formatted text file `rmpy.txt`. The data are monthly, 1960:1 to 2005:3. Use these data to estimate a reduced form VAR. Use the default values for the sum of coefficients and cointegration dummy observations in `mgndnsty.R`, `rfvar3.R` or `rfvar3.m` to do the estimation. If you use other software, you will need to figure out for yourself how to implement the corresponding dummy observations. The data in the text file on the web site are log values of the non-interest-rate variables and annual percentage rates for the funds rate. For the `.RData` file none of the data have been logged. It can ease interpretation also to divide the `ffr` series by 100, so all the residuals are expected to be the same order of magnitude.

- (a) Calculate the posterior probabilities of at least four priors, varying the values of `lambda`, `mu`, and/or `mnprior$tight` (or `mnprior.tight` in the matlab version) by factors of two. For any with posterior probabilities larger than .05, calculate impulse responses and comment on whether the results imply that uncertainty across the sets of prior parameters you have tried generates additional uncertainty about the impulse responses. The **R** program `mgndnsty.R` returns both the integrated posterior for the model and the VAR estimates. The matlab program with the same name only calculates the integrated posterior, so separate runs of `rfvar3.m` and `mgndnsty.m` are required.
- (b) Calculate and plot impulse responses with error bands for the prior with highest posterior odds. For the error bands, you will have to sample from the posterior. This can be done without MCMC methods. The **R** program `postdraw.R` automates drawing from the posterior. There is no corresponding matlab program at this point, but it might not be too difficult to translate it to matlab. The `impulsdtrf.R` calculates impulse responses, and there is a corresponding matlab program.
- (c) There may be an additional component or two added to this exercise, but this should get you started. The matlab and **R** software has been tested, but not very intensively, so it could turn out to be buggy. Let me know by email promptly if you think you have found a bug. If you have questions about the programs or programming, we can discuss them at the beginning of lecture on Thursday, 11/30.

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