Econ. 556b Spring 1999 Chris Sims

Exercise: Handling Low-Frequency Variation in Practice

In this exercise, you will be working with the same 5 variables as in the last one. A common data set for everyone to work with is in the files `rmpyu.txt` and `rmpyu.csv` on the web page. Both these files are ascii. The .txt file is tab-delimited, without date or variable name labels, and can be read directly into matlab as a 158x5 matrix. The .csv file is in "comma-separated values" format, and can be read in to most spreadsheets, where it will show up with the Citibase variable names across the top and the dates down the left side. It can also be viewed with ordinary ascii editors.

Transform all the series except r (fygn3) by taking natural logs. Multiply r by .01, so that it is on roughly the same scale of variation as the other variables.

1. Estimate an unrestricted 5-variable, 5-lag reduced form VAR with constant terms by OLS for these data. Use the estimates to form 5 $\hat{y}_i(t) = E_0[y_i(t)]$, $t = 1, \ldots, T$ time series. Plot each $\hat{y}_i(t)$ on the same graph with the corresponding actual $y_i(t)$ and discuss whether your estimates imply an implausible amount of long-run predictability.
2. Form a flat-prior posterior 68% probability band for the impulse response of p (gdpdfc) to u (lhur) shocks. That is, generate a sample from the posterior distribution of the model's coefficients, and display, point-by-point, the 16th and 84th percentiles of the sample distribution of the response. Use a Choleski orthogonalization of the covariance matrix, with u first in the ordering; i.e. orthogonalize so that u shocks have contemporaneous impact on all variables and have zero contemporaneous response to all other variables. To conserve on computer memory and disk space, you may want to compute the posteriors only at impulse responses horizons of 1,2,4,8,16 and 32 quarters instead of at all 32 horizons. Use at least 200 draws to form your bands. Use 1000 draws if this does not use unreasonable amounts of computer time.
3. Form a likelihood ratio test for Granger causal priority of the *rmpy* block relative to u. Assess its implications using the classical asymptotic χ^2 test distribution at the 5% level and the general method-of-Laplace formula that drops terms involving the prior. (This partially repeats the last exercise, but we need to have results that are comparable in order to compare to the dummy-observation computations below.)
4. Add to the data a set of "sum of coefficients" dummy observations (there will be 5) with unit weight and a single "no-change forecast" dummy observation with weight 2 and repeat the exercises above. Discuss whether conclusions about the importance of u for predicting p are changed by using the dummy observations.