CCF-LSAP-MacroEffects

These codes reproduce the results in:

Chen, H., Cúrdia, V., and Ferrero, A. (2012)
The Macroeconomic Effects of Large-Scale Asset Purchase Programs
The Economic Journal, 122, pp. 289-315.

Technical Appendix

These replication codes are available online at:
https://github.com/vcurdia/CCF-LSAP-MacroEffects

Requirements

Matlab (R)

The codes were tested using Matlab (R) R2012a with the following toolboxes

- Symbolic Toolbox
- Statistical Toolbox
- Optimization Toolbox

LaTeX

LaTeX is used by some tools to compile certain documents.

`epstopdf`, included in most LaTeX releases, is used by some tools.

Additional codes needed

- VC-Tools by Vasco Cúrdia, version v1.5.0
- VC-BayesianEstimation by Vasco Cúrdia, version v1.5.0
- gensys by Chris Sims
- optimize by Chris Sims
- KF by Chris Sims

Description of Replication Codes

Estimation

`RPRatioSetDSGE.m`
Sets up the model for estimation and runs all the steps for estimation generating appropriate logs, estimation reports and diagnostics in a fully automated mode.

`Data_1975q1_2009q3_BLMVB.mat` Contains the data, ready to be used in Matlab.

Note: it may take a long time to run with the current settings without using a parallel computing cluster because with default the following estimation stages are implemented:

1. Run 20 posterior numerical mode searches starting at different guess vectors. For each of those it will restart the search up to 30 more times to confirm that it is not a local mode.

2. Will run three stages of Markov-Chain-Monte-Carlo (MCMC) each for four separate chains:
   2.1. First stage uses the negative of the inverse hessian at the posterior peak to form the covariance matrix for MCMC draws, scaled to have a rejection rate between 70 and 80 percent (numerical search). It generates 100,000 draws using a Metropolis algorithm.
   2.2. After the previous stage, the code discards the first quarter of the draws for each chain, combines the remain from each chain and computes the covariance matrix, which is then used as the new covariance for the next stage of MCMC. It is again numerically rescaled to yield a rejection rate between 70 and 80 percent. It generates 200,000 draws.
   2.3. We repeat step 2.2. one more time.

In each of the MCMC stages a full report with diagnostics and some inference is generated. It also produces a reduced set of draws (1000 by default) needed to make the simulations for the paper. The one for the last stage is included with the codes: `RPRatioMCMCDrawsUpdate2Redux.mat`

Table 2 in the paper is a slight modification of the first table in the report for the last estimation stage.

Model simulations

`BLMVBSimSetup.m`
Sets up the model for simulations, with some additional variables that were not needed for estimation but are needed for the simulations.

`ModelSimRun.m`
Main script to generate all simulations with the model. Offers many options and switches to tweak simulations and plots.

`ModelSimRun.m` requires `BLMVBSimSetup.m` to be run first and calls the following files:

- `ModelSimRunFcn.m`
  Subfunction to use inside a loop to generate simulations for each draw.
- `RPRatio.mat`
  Contains the estimation results (but not the MCMC Draws).
- `RPRatioMCMCDrawsUpdate2Redux.mat`
  Contains a reduced sample from the MCMC Draws.

To make replication of results simpler below are listed five scripts that are similar to ModelSimRun.m but with options and switches set to generate excatly the figures in the paper. They need to be run in this order to avoid any missing files:

- `MakeFig1.m`
- `MakeFig2.m`
- `MakeFig3.m`
- `MakeFig4.m`
- `MakeFig5.m`

The corresponding figures in pdf format are saved in subdirectories.