PS6 2025 – Questions (Due 11 November 2025)

This session is based on the work of Justiniano and Preston in their 2010 paper, "Monetary policy and uncertainty in an empirical small open economy model", *Journal of Applied Econometrics*, vol.25, no.1, pp. 93-128, in which they estimate a two-country DSGE model, one small, the other representing the ROW.

1. Go to the JAE archives and download the data files used by JP-2010.
2. Complete the attached Dynare mod-file "JP2010_skeleton.mod", inserting the four missing (log-linear approximation) equations; call this "JP2010_Q2.mod" and run a simulation to ensure that the model functions correctly. ***Note that some of the equations differ a bit from those listed in JP-2010; do not worry about this - use them as listed in the JP2010_skeleton.mod file!*** [In particular, the foreign sector is here estimated as in the Monacelli paper cited in JP-2010.] For the simulation, define the standard errors of all eight shocks to be 1.
3. Construct an appropriate data-file for estimation of the model using the Australian data provided by JP-2010.
4. Noting carefully the information provided by JP-2010, add to the mod-file both Measurement Equations and an Estimation command; call this "JP2010_Q4.mod". Following Table I of the paper, set up the required priors. Contrary to Table I of the paper, use a mean of 1 instead of 0.5 for the various standard errors. Since Table I does not give priors for the foreign variables, I have included these in the Dynare mod-file "JP2010_skeleton.mod".
5. Estimate by RegMLE the complete Q4 model (***including*** α but ***excluding*** β, which should be calibrated at 0.99, and ρ_{cp} which is not in fact used) using "presample=4" and "mode_compute=4". (To avoid a lengthy MH sequence, remember to use "mh_replic=0".) ***Note that JP-2010 also fix α and χ, but you will be estimating them***. Comment on your results, with particular attention to the "deep" parameters and monetary policy.
6. Re-estimate the model in Q4 but ***calibrating*** α at 0.185 [as did JP2010], and compare your results with those in Q5 above.

7. a. Re-estimate the model in Q6 but substituting for the foreign block 3 simple AR(1) equations for ***y**** , π^* and ***i**** . Note that this will require you to be very careful in deleting various parameters and variables and adding others! However, rather than creating a new variable epsilon_ystar, use ***epsilon_astar*** in the AR(1) process for ***y_star***.
   b. Re-estimate the model in Q7a but in place of the AR(1) equation for ***i**** , substitute the original Q4 Foreign Taylor Rule (ie, with π^* and ***y**** as variables, an interest-rate smoothing term and a simple IID error term).
   c. Compare your results from Q7a,b with those in Q6 above. You may use the attached Matlab file "JP2010_irf_comp3.m" to construct a comparison of the IRFs. [Note that this file requires the Matlab file "plot_comp.m", also attached, and that both be in the same directory as the Dynare model results. You will also need to modify the directory names to agree with your own.]
8. Now re-estimate the model from Q6 with the following two alternative monetary policy functions: (a) a Taylor Rule with π and ***y*** as variables, plus an interest-rate smoothing term and a simple IID error term; (b) the Taylor Rule in (a) plus a term in Δe. Compare your results and comment on the differences in response with respect to a cost-push shock.
9. [***Optional***] Re-estimate the model you prefer from all those above using the ***DSGE-VAR*** technology, and compare your results with those in Q6. Set "first_obs=10", "mode_compute=1" and "mh_replic=0" in the estimation and delete "presample=4". Estimate two versions of the DSGE-VAR model, one with a VAR of 4 lags, and the other with 8 lags.
10. Which of the various models estimated would you present to the Reserve Bank of Australia's Monetary Policy Committee and why?