DYNARE SUMMER SCHOOL 2018

Exercises on introduction and local approximation

1. `rbc1.mod`

   (a) Go to directory `rbc` and run `rbc1.mod`. If something isn't working, it must be a problem with Dynare installation. Ask for help.

   (b) Look at the content of `rbc1.m`, `rbc1_static.m`, and `rbc1_dynamic.m`.

   (c) Add an option to `stoch_simul` so as to only see the useful part of the IRFs.

   (d) Modify the value of some parameters, one at the time, and observe the changes on

      i. the reduced form coefficients,

      ii. the moment of the endogenous variables,

      iii. the IRFs.

   (e) Identify the left handside of the first equation in `rbc1_static.m` and in `rbc1_dynamic.m`

   (f) Check by hand its derivative with respect to `C_t` and locate it in `rbc1_dynamic.m`

   (g) In the model, replace the Cobb-Douglas production function by a C.E.S. function:

   $$Y_t = A_t \left(\alpha K_{t-1}^{\psi} + (1 - \alpha) \left((1 + g)^t L_t \right)^{\psi} \right)^{\frac{1}{\psi}}$$

   - Derive the modified first order conditions
   - Write `rbc2.mod`, for the modified version of the model
   - It is not possible to derive the analytical steady state anymore. Use `initval` instead of `steady_state_model` to compute the steady state of the model
   - Choose first a value very close to 1.0 for the elasticity of substitution in order to verify that you find the same results as in the Cobb-Douglas case.
   - Try with different values for the elasticity of substitution

2. `jermann98/jermann98.mod`: change the value of the parameters for consumption habits and investment adjustment cost and observe the effect of the risk premium. Try second and third order approximation.

3. Compute the log-linear approximation of the stationarized version of the RBC model in `rbc1.mod`: replace all the variables by the log of the variable (change the name of the variables for clarity) and modify the equations accordingly.