## Assignment 3

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### List of things done

1. Ran “RBC\_basic.mod” and “RBClinear\_basic.mod” provided.
2. Corrected parameter values in “RBC\_hab.mod” to match parameter values
   * Parameterizations are different between “RBC\_basic.mod” in this module and that of the previous week…
   * Set , corresponding to zero adjustment costs.
3. Ran “RBC\_hab.mod” for habit parameters .
4. Linearized RBC model with External Habitat and created “RBClinear\_hab.mod”.
5. Ran “RBClinear\_hab.mod” for habit parameters .

### Linearization and the basic RBC model

A graph of a function

Description automatically generated with medium confidence

This figure plots the TFP shock IRF results for the basic nonlinearized RBC model (black), nonlinearized external habitat RBC model with habitat parameter set at zero (red), and the linearized RBC model (green). From parameterization of the external habitat model, we clearly see that when , it becomes the standard RBC model. As such, it is no surprise that Hab0 and RBCbasic yield identical IRFs. Because the lines coincide, we conclude that the linearized (RBClinear) model does very well at approximating the nonlinear model. Intuitively, this makes sense because there are no external sources of friction, so the errors of approximation would be minimal.

### Comparing External Habit Models

A graph of a function

Description automatically generated with medium confidence

These two figures compare the nonlinear and linearized model with external habit; Top panel presents the (TFP shock) IRFs to the case when ; Bottom panel presents the (TFP shock) IRFS to the case when . Generally, the linearized model can capture most of the information conveyed in the nonlinear model, albeit with reduced curvature. More curvature is introduced to the external habit model as the magnitude of the friction increases. Thereby, the linearized version of the model performs slightly worse than in the case with lower curvature.

A graph of a function

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