

Assignment 4
International Macroeconomics
Fall 2007
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Due October 22

1. **Alternative Formulations of Adjustment costs** In class, we considered an RBC model of a SOE featuring capital adjustment costs of the form

$$\frac{\phi}{2}(k_{t+1} - k_t)^2.$$

Consider now an economy identical to the one considered in class, except that the adjustment cost function now takes the form

$$\frac{\tilde{\phi}}{2} \left(\frac{k_{t+1}}{k_t} - 1 \right)^2 k_t.$$

Suppose that all parameters in both economies take identical values, except ϕ and $\tilde{\phi}$. Establish analytically whether, given a value of ϕ , one can find a value of $\tilde{\phi}$ such that both economies exhibit identical equilibrium dynamics up to first order.

2. Consider the RBC SOE economy studied in class. Compute the autocorrelation function of the trade balance-to-output ratio up to order 10.
3. Consider the RBC, SOE studied in class. Assume that the subjective discount factor is constant. That is, let $\theta_{t+1}/\theta_t = \beta$, where $\beta \in (0, 1)$ is a parameter. Set $\beta = 1/(1+r)$. Consider a nonstochastic steady state in which $d_t = d_{t-1} = d$. Set d and all structural parameters of the model at the values given for the economy studied in class. Compute the second moments analyzed in class (i.e., the standard deviations, serial correlations, and correlations with output of output, consumption, investment, hours, the trade balance-to-output ratio). Of course, the log-linearized version of the economy considered here possesses a unit root, which prevents the computation of unconditional moments. Instead, consider simulating a finite sample of 50 periods starting at the steady state and drawing innovations to total factor productivity, ϵ_t , from the normal distribution $N(0, \sigma_\epsilon^2)$, where σ_ϵ takes the value assumed in class. From this simulation, compute the second moments of interest. Replicate this experiment 2000 times. Report the average of the second moments of interest across the 2000 replications.