

ECON 5110 Problem Set #2

Due: Tuesday, February 17, 2009

Solving a simple RBC model. Consider a social planner that maximizes (by choosing $\{C_t, N_t\}_{t=0}^{\infty}$)

$$E_0 \sum_{t=0}^{\infty} \beta^t [(1 - \phi) \log(C_t) + \phi \log(1 - N_t)]$$

subject to

$$C_t + K_{t+1} - (1 - \delta)K_t \leq z_t K_t^{1-\theta} N_t^\theta$$

where $z_t = z_{t-1}^\rho \exp(\epsilon_t)$, $\epsilon_t \sim iid(0, \sigma^2)$ and K_0 given.

1. (a) Using the method outlined in class, find the VAR for the state vector $S_{t+1} = (\hat{K}_{t+1}, \hat{z}_{t+1})'$, where a hat above the variable indicates percent deviation from the steady-state value. Also find the policy functions that relate the vector $(\hat{Y}_t, \hat{C}_t, \hat{N}_t)'$ to S_t .
(b) Use both solution procedures outlined in class to calculate the impulse responses of \hat{K}_t , \hat{Y}_t , \hat{C}_t , and \hat{N}_t to a one-time, one-standard deviation shock to technology.
(c) How close are the two solutions?
(d) Do the shapes of these impulse responses fit with your economic intuition? Explain.