

In the standard RBC model, all households have access to the capital market. In the real economy, however, not all households participate in the capital market. To account for this fact, we consider an RBC model with limited capital market participation.

We assume $(1-\chi)$ fraction of households are capital holders. χ is a parameter that takes a value from 0 to 1. The capital holders' problem is to choose c_t^c, h_t^c, i_t^c to maximize the discounted-sum of utility:

$$\begin{aligned} \max_{c_t^c, h_t^c, i_t^c} E \sum_{t=0}^{\infty} \beta^t u(c_t^c, h_t^c), \quad 0 < \beta < 1 \\ \text{s.t.} \quad c_t^c + i_t^c \leq w_t h_t^c + r_t k_{t-1}^c \\ k_t^c = (1 - \delta) k_{t-1}^c + i_t^c \end{aligned}$$

The remaining χ fraction of households do not hold capital and hence their problem is given by

$$\begin{aligned} \max_{c_t^n, h_t^n} E \sum_{t=0}^{\infty} \beta^t u(c_t^n, h_t^n), \quad 0 < \beta < 1 \\ \text{s.t.} \quad c_t^n \leq w_t h_t^n \end{aligned}$$

We use the “c” superscript for choices made by capital holders and the “n” superscript for choices made by non-capital holders. The instantaneous utility function for both capital and non-capital holders is given by

$$u(c, h) = \ln c - \varphi \frac{h^{1+\eta}}{1+\eta}$$

where φ and η are parameters.

The production function is given by $Y_t = z_t K_{t-1}^\alpha H_t^{1-\alpha}$, where $(1-\chi)k_t^c = K_t$ and $(1-\chi)h_t^c + \chi h_t^n = H_t$. The technology shock follows a standard AR(1) process ($\ln z_t = \rho \ln z_{t-1} + \epsilon_t$) and the resource constraint is given by $C_t + I_t = Y_t$, where $(1-\chi)c_t^c + \chi c_t^n = C_t$ and $(1-\chi)i_t^c = I_t$.

1. Define the sequential market equilibrium, including the household's problem and the firm's problem.
2. Define the recursive competitive equilibrium, including the household's problem and the firm's problem.
3. Derive the equilibrium conditions of this economy.
4. Suppose there is a positive technology shock. What happens to capital holders' hours worked? What happens to non-capital holders' hours worked? What explains the difference between capital holders' and non-capital holders' hours responses, if any?