

An RBC model with asset price, irreversibility, and endogenous labor supply

A representative firm solves the following problem:

$$J(k; S) = \max_{k', n} Ak^\alpha n^{1-\alpha} - w(S)n - k' + (1 - \delta)k + \beta \mathbb{E}M(S, S')J(k'; S')$$

$$\text{s.t. } k' - (1 - \delta)k \geq \phi I_{ss}$$

where I_{ss} is the steady-state investment level.

The household-side problem is as follows:

$$V(a; S) = \max_{c, N, a'} \log(c) - \frac{\eta}{1 + \frac{1}{\chi}} N^{1 + \frac{1}{\chi}} + \beta \mathbb{E}V(a'; S')$$

$$\text{s.t. } c + \int a'(S') d\Gamma_{S'} = a + w(S)N$$

The stochastic discount factor $M(S, S')$ and wage $w(S)$ are determined at the competitive market:

$$[M] : \quad a(S) = J(k(S); S)$$

$$[w] : \quad N(S) = n(S)$$