

An RBC model with asset price and investment irreversibility

A representative firm solves the following problem:

$$\begin{aligned} J(k; S) &= \max_{k'} Ak^\alpha - k' + (1 - \delta)k + \beta \mathbb{E}M(S, S')J(k'; S') \\ \text{s.t. } k' - (1 - \delta)k &\geq \phi I_{ss} \end{aligned}$$

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

The household-side problem is as follows:

$$\begin{aligned} V(a; S) &= \max_{c, a'} \log(c) + \beta \mathbb{E}V(a'; S') \\ \text{s.t. } c + \int q(S, S')a'(S')d\Gamma_{S'} &= a \end{aligned}$$

The stochastic discount factor $M(S, S')$ is determined at the competitive market:

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