

An RBC model with asset price

A representative firm solves the following problem:

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

The household-side problem is as follows:

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

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

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