The model of Krusell and Smith (1998)

Recursive formulation

The heterogeneous household's problem is as follows:

$$V(a, z; S) = \max_{c, a'} \; log(c) + \beta \mathbb{E} V(a', z'; S')$$

$$\text{s.t.} \quad c + a' = (1 + r(S))a + w(S)z$$

$$a' \geq 0$$

$$S' = \Gamma_S(S) \quad \text{(Aggregate law of motion)}$$

$$z' \sim \pi(z'|z)$$

where $S = \{\Phi, A\}$ is the aggregate state.

The production side is as follows:

$$\max_{K, L} A K^\alpha L^{1-\alpha} - w(S)L - (r(S) + \delta)K$$

The capital rent $r(S)$ and the wage $w(S)$ are determined at the competitive market:

$$[r]: \quad \int a'(a, z; S) d\Phi(S) = K'(S)$$

$$[w]: \quad \int z d\Phi(S) = L(S)$$