Krusell and Smith (1998) with endogenous labor supply, investment irreversibility, and fiscal spending shock.

Recursive formulation

The heterogeneous household's problem is as follows:

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

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

$$a' - (1-\delta)a \geq \phi I^{ss}$$

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

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

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

The production side is as follows:

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

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

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

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