An RBC model with endogenous labor supply (Frisch elasticity-based)

Recursive formulation

The representative household solves the following problem:

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

$$\text{s.t. } (1+\tau^c)c + a' = (1+(1-\tau^r)r(S))a + (1-\tau^w)w(S)N$$

where the aggregate state S is as follows

$$S = [K, A].$$

K is the aggregate capital stock. A is TFP that follows the log AR(1) process:

$$log(A') = \rho log(A) + \sigma\epsilon, \quad \sigma \sim N(0,1).$$

c is consumption, a is the wealth in the beginning of a period. The prices $w(S)$ and $r(S)$ are determined at the competitive labor and capital input markets. A production sector that operates using the CRS Cobb-Douglas production function:

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

Then, we close the economy by introducing the following market clearing conditions at which the prices (w, r) are determined:

	Supply		Demand
[Capital market]	a	$=$	K
[Labor market]	N	$=$	L