

A canonical RBC model

Recursive formulation

The representative household solves the following problem:

$$\begin{aligned} V(a; S) &= \max_{c, a', N} \log C + \theta \log(1 - N) + \beta \mathbb{E} V(a'; S') \\ \text{s.t. } (1 + \tau^c)c + a' &= (1 + (1 - \tau^r)r(S))a + (1 - \tau^w)w(S)N \end{aligned}$$

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, and 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:

	<u>Supply</u>	<u>Demand</u>
[Capital market]		$a = K$
[Labor market]		$N = L$