# Overlapping Generations Model: Example

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# Government Bonds

Demographics: $N_t = (1+n)^t$. Agents live for 2 periods.

Preferences:

$$(1-\beta)\ln(c_t^y) + \beta \ln(c_{t+1}^o)$$

Endowments:

- The initial old are endowed with $s_0$ units of capital.
- Each young is endowed with one unit of work time.

# Environment

Technology:

$$C_t + K_{t+1} - (1-\delta)K_t = F(K_t, L_t) = K_t^{\alpha} L_t^{1-\alpha}$$

Government: The government only rolls over debt from one period to the next:

$$B_{t+1} = R_t B_t$$

Markets: for goods, bonds, labor, capital rental.

# Questions

1. Solve the household problem for a saving function.
2. Derive the FOCs for the firm.
3. Define a competitive equilibrium.
4. Derive the law of motion for the capital stock

$$(b_{t+1} + k_{t+1})(1+n) = \beta(1-\alpha)k_t^{\alpha} \tag{1}$$

   where $b = B/L$.
5. Derive the steady state capital stock for $b = 0$. Why does it not depend on $\delta$?
6. Derive the steady state capital stock for $b > 0$.
7. Show that the capital stock is lower in the steady state with positive debt (crowding out).