9/11/2020 Recitation

Big Picture:

Sector problem

Equilibrium

State variable

k_{t+1} law of motion

steady state

What to know where the economy is heading to and will end in

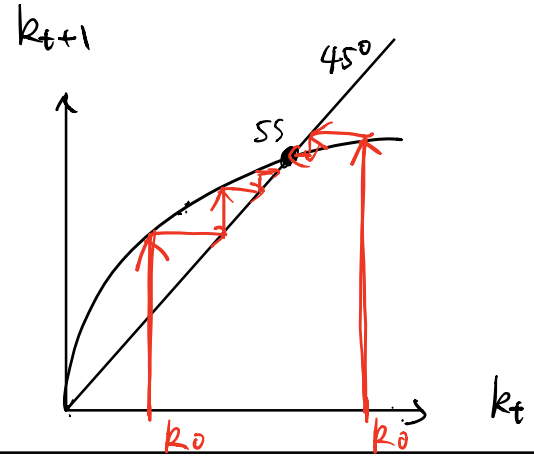
Money in OLG

m state variable.

→ law of motion for m

In standard model, state variable is k.

Law of motion for k is $k_{t+1} = \frac{\beta}{1+\beta}\frac{1-\theta}{1+n}k_t^{\theta}$



stable

In OLG with money.

$$m_t = s\left((1+n)m_{t+1}/m_t\right)$$??

Want to map m_t into m_{t+1}. How?

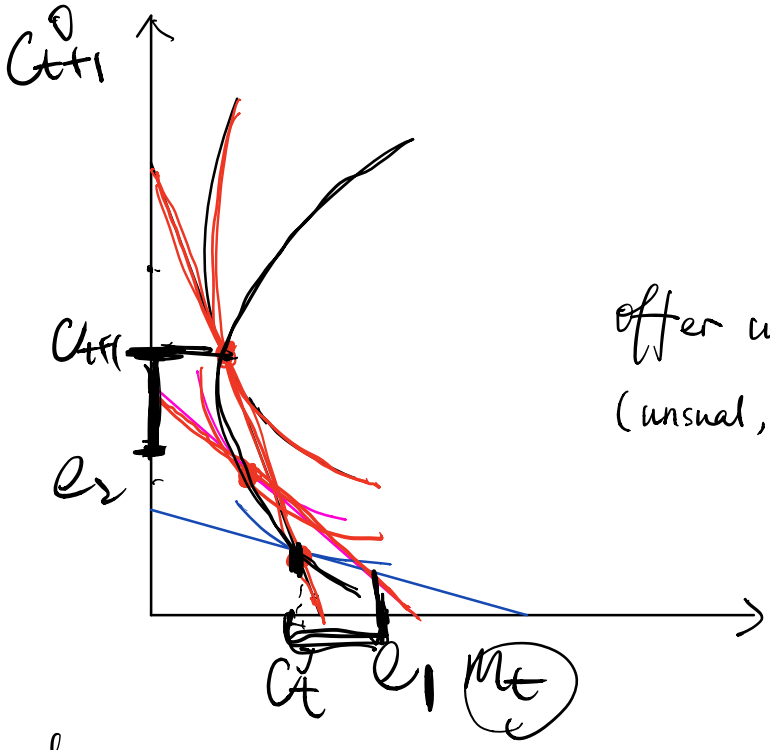
- $m_t = s(R_{t+1})$
- m_{t+1} can be linked to $s(R_{t+1})$

$\Rightarrow$ young B.C and old B.C are linked together. affected by R_{t+1}

$\Rightarrow$ Lifetime BC

$$c^o_{t+1} = -R_{t+1} c^y_t + R_{t+1}(e_1 + e_2)$$

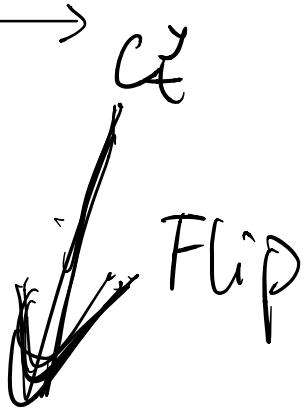
constants

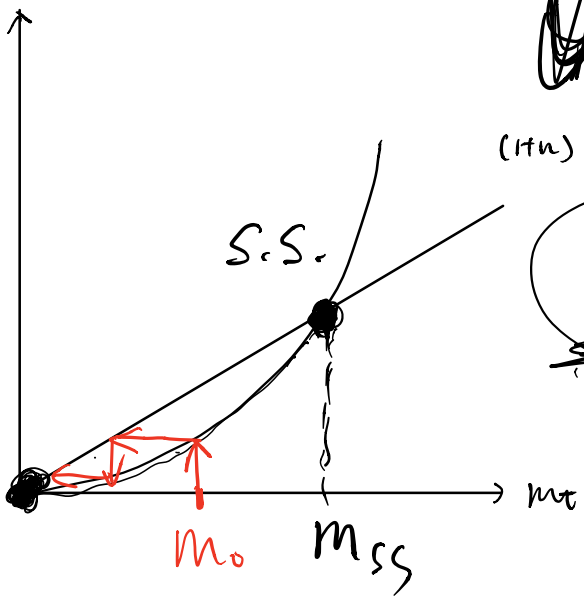


offer curve

(unusual, hard to grasp)

Law of motion, steady state

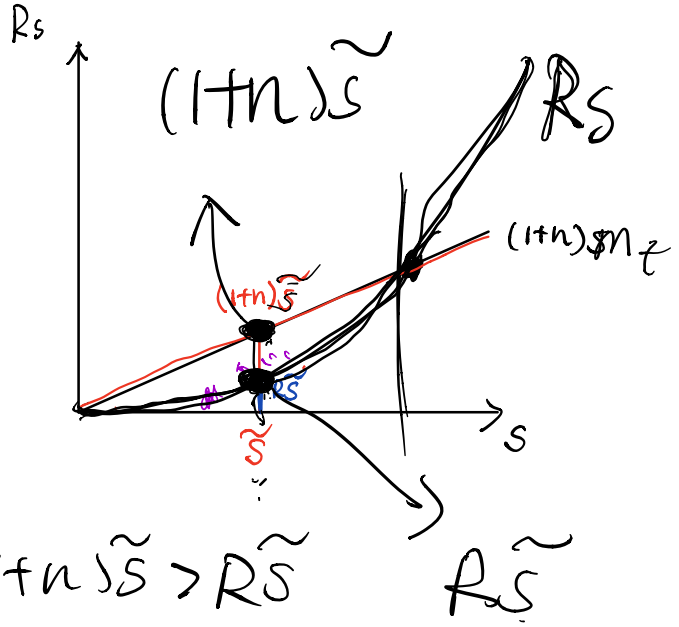




Unstable

$S = M$

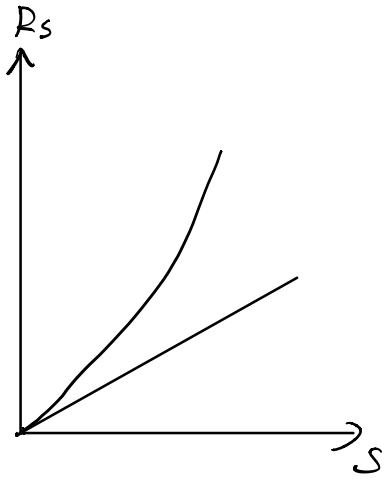
Samuelson (P_{30})



$(1+n)\tilde{S} > R\tilde{S}$

$\therefore (1+n) > R$

classical



$R > (1+n)$

Dynamic Efficiency

$$f'(k_{GR}) = n + \delta$$

$f'(k) < n \Rightarrow$ dynamic inefficiency.

$(1+r) < 1+n$

$R < 1+n$

Fiscal Theory of the Price Level

- Gov: $\frac{M_{t+1} - M_t = P_{t+1} G_{t+1}}{M_{t+1} P_{t+1}}$

Gov: $M_{t+1} = M_t(1+\theta)$

- HH: $\max \; u(c_t^y) + \beta u(c_{t+1}^o)$

s.t. $P_t c_t^y + P_t x_t = P_t e_1$

$P_{t+1} c_{t+1}^o = P_{t+1} e_2 + P_t x_t$

$$\mathcal{L} = u(c_t^y) + \beta u(c_{t+1}^o) + \lambda_t \left[e_1 - c_t^y + \frac{P_{t+1}}{P_t} e_2 - \frac{P_{t+1}}{P_t} c_{t+1}^o \right]$$

F.O.C. $u'(c_t^y) = \lambda_t$

$\beta u'(c_{t+1}^o) = \lambda_t \frac{P_{t+1}}{P_t}$ $\Rightarrow$ E.E. $u'(c_t^y) = \beta \frac{P_t}{P_{t+1}} u'(c_{t+1}^o)$

R

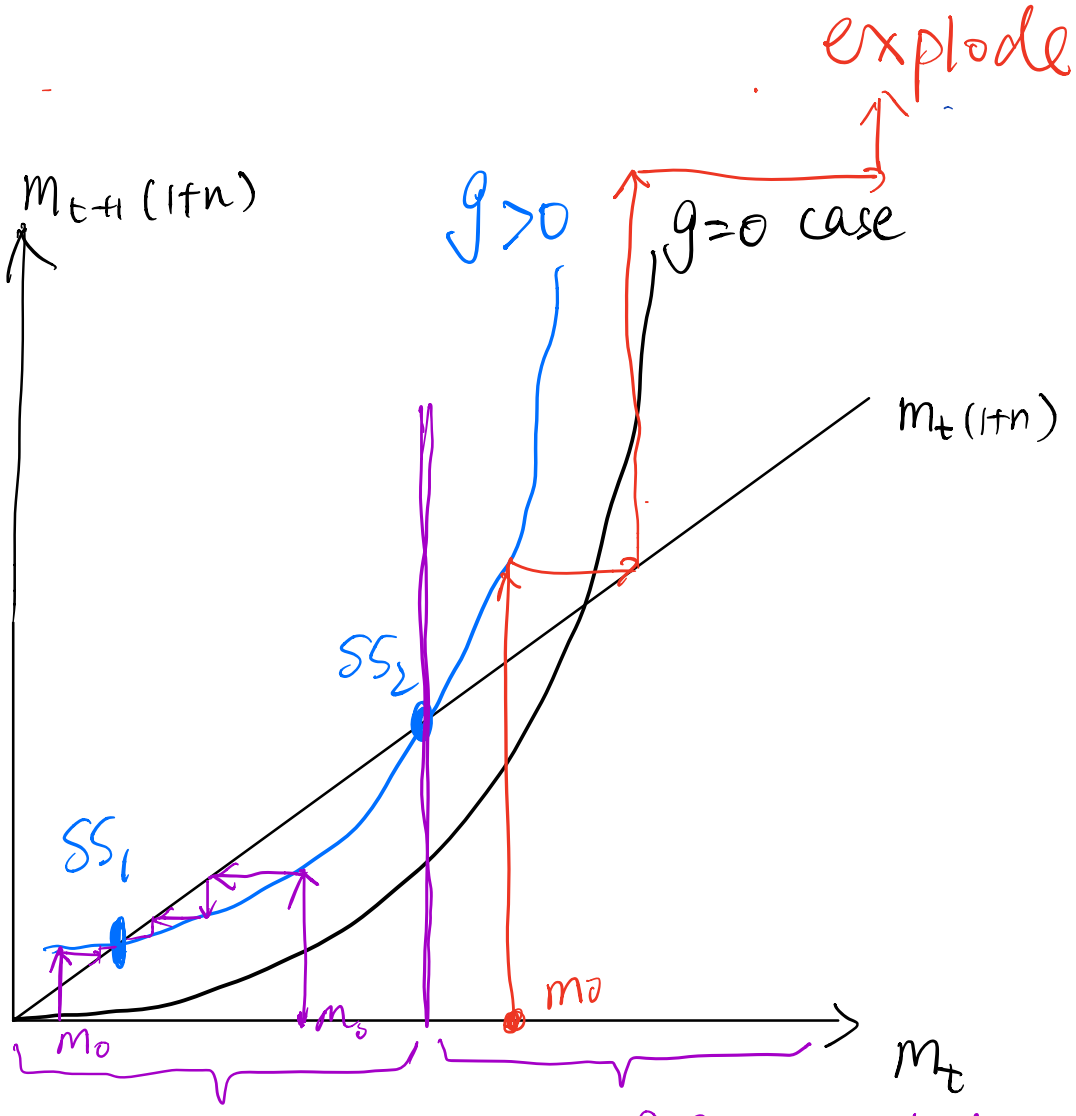
- CE:

Allocations $\{c_t^y, c_t^o, x_t, M_t\}$ price $\{P_t\}$, s.t.

- HH: 2 BC, 1 EE
- Gov: BC
- Goods Mkt
- Money Mkt

Characterize equilibrium

$$m_{t+1} = s\left((1+n)\frac{m_{t+1} - g_{t+1}}{m_t}\right)$$



Any starting point m_0 will converge to SS_1

if economy starts in this region, it explodes