

$$\max_{s_t} \left\{ U(\underbrace{w_t - a_t - s_t}_{c_t^y}) + \beta U(\underbrace{R_{t+1}^e s_t + z_{t+1}^e}_{c_{t+1}^o}) \right\}$$

labor income  $\downarrow$   $w_t$   
 taxes/transfer  $\downarrow$   $a_t$   
 saving  $\downarrow$   $s_t$   
 income from savings  $\downarrow$   $R_{t+1}^e s_t$   
 gross return  $\downarrow$   $R_{t+1}^e$   
 saving  $\downarrow$   $s_t$   
 expected transfer/tax  $\downarrow$   $z_{t+1}^e$

FONC:

$$\frac{\partial U(c_t^y)}{\partial c_t^y} \cdot \frac{dc_t^y}{ds_t} + \beta \frac{\partial U(c_{t+1}^o)}{\partial c_{t+1}^o} \cdot \frac{dc_{t+1}^o}{ds_t} = 0$$

$$\Rightarrow \frac{1}{c_t^y} \cdot (-1) + \beta \frac{1}{c_{t+1}^o} \cdot R_{t+1}^e = 0$$

since  $U(c) = \ln(c)$

$$\Rightarrow \frac{1}{w_t - a_t - s_t} = \frac{\beta R_{t+1}^e}{R_{t+1}^e s_t + z_{t+1}^e}$$

$$\Rightarrow R_{t+1}^e s_t + z_{t+1}^e = \beta R_{t+1}^e (w_t - a_t - s_t)$$

$$\Rightarrow (1 + \beta) R_{t+1}^e s_t = \beta R_{t+1}^e (w_t - a_t) - z_{t+1}^e$$

$$\Rightarrow s_t^* \equiv s(w_t, R_{t+1}^e, a_t, z_{t+1}^e) = \frac{\beta}{1+\beta} (w_t - a_t) - \frac{1}{1+\beta} \cdot \frac{z_{t+1}^e}{R_{t+1}^e}$$

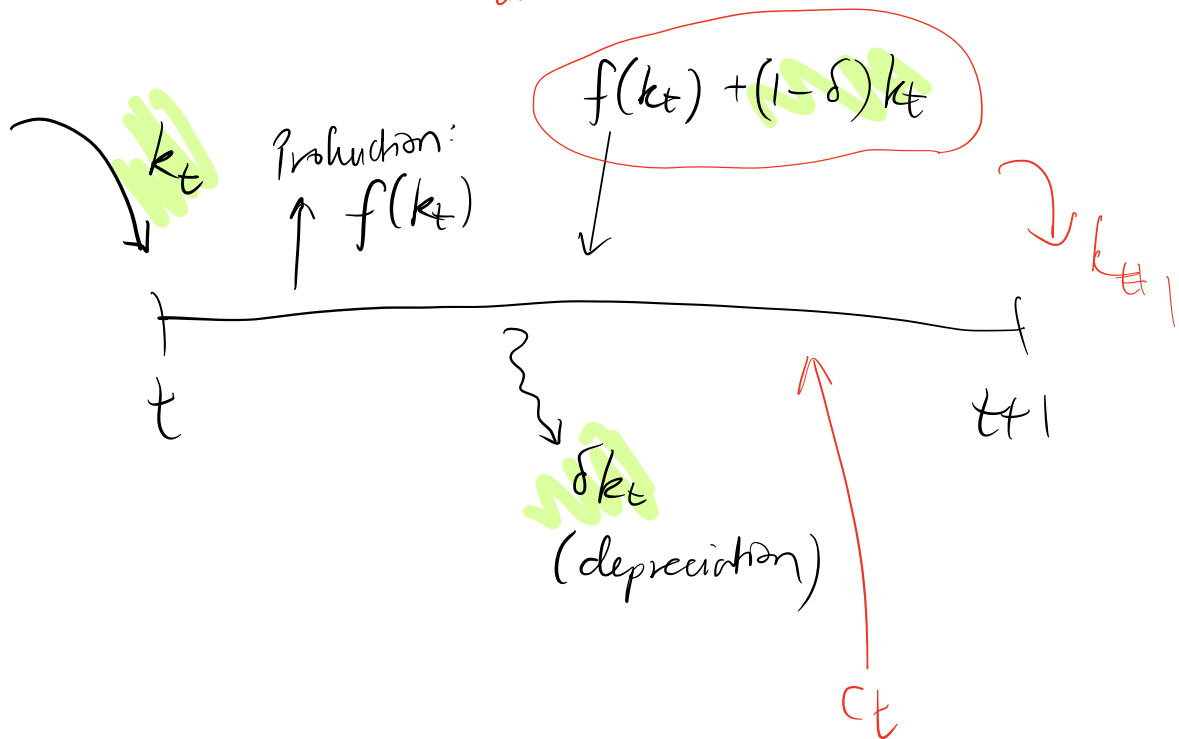
labor income  
 tax/transfer from/to young  
 net income (young)  
 P.V. of expected future tax/transfer  
 how sensitive  $s_t$  is to future taxes

$0 < mps < 1$

show:

$$\frac{\partial \left( \frac{\beta}{1+\beta} \right)}{\partial \beta} > 0$$

$$\tilde{f}(k_t) = \underbrace{k_t^\alpha}_{\substack{\text{output} \\ \text{(per worker)} \\ \text{during} \\ \text{date } t}} + \underbrace{(1-\delta)k_t}_{\substack{\text{remaining} \\ \text{capital after} \\ \text{depreciation}}}$$



$$\underline{k_{t+1}} = \tilde{f}(k_t) - c_t$$