Let $f(k)$ be s.t.

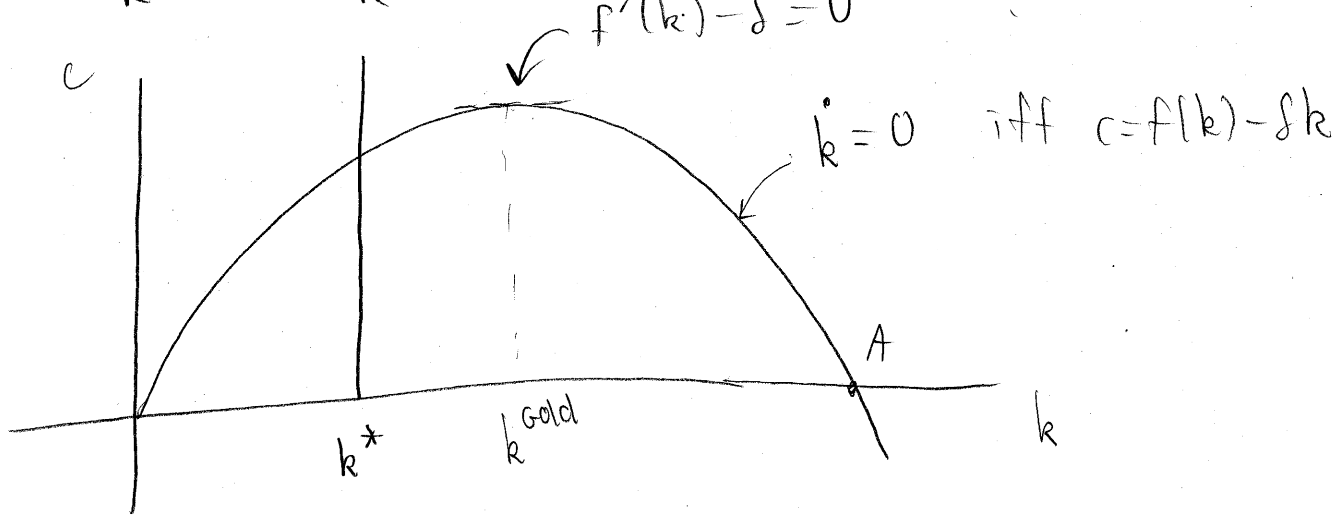
$$c = f(k) - \delta k$$

$$s = \frac{\delta k}{y} = \delta \cdot \frac{1}{f(k)/k} = g\left(\frac{f(k)}{k}\right)$$

$$f(k) = k^\alpha + A$$

$$f'(k) = \alpha k^{\alpha-1} \neq g(A)$$

$$\frac{f(k)}{k} = \frac{k^\alpha + A}{k} \uparrow \text{ in } A \Rightarrow s \downarrow \text{ in } A.$$



- A is not optimal because we can go to c^{Gold} and consume more in every single future period.

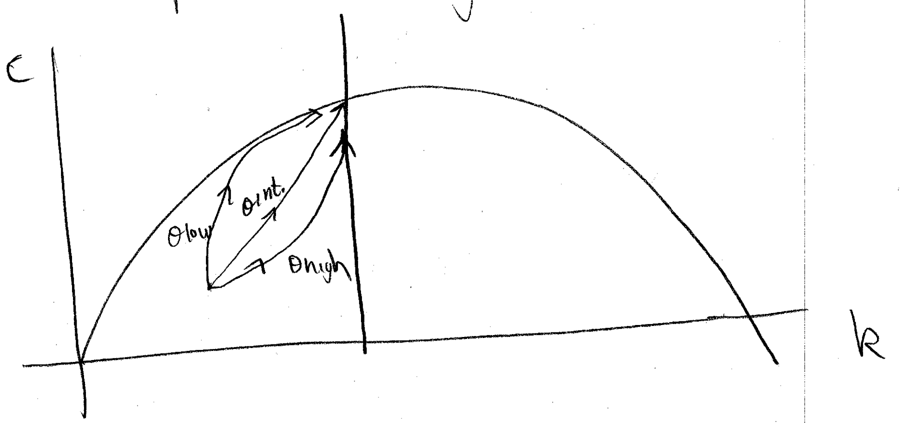
$$U_0 = u_0 + \beta u_1 + \beta^2 u_2 + \beta^3 u_3 + \ldots$$

$$U_1 = u_1 + \beta u_2 + \beta^2 u_3 + \ldots$$

- What if SP maximizes U_1 instead of U_0?
  - still have Pareto Optimality. (Will be a corner solution)

In the phase diagrams, phase boundaries do not change as θ changes

Optimal path changes with θ:



Recall:

$$\dot{c} = \theta c[f'(k) - \delta - \rho]$$

$$\dot{k} = f(k) - \delta k - c$$

$$\Rightarrow \frac{\dot{c}}{\dot{k}} = \frac{dc}{dk} = \frac{\theta c[f'(k) - \delta - \rho]}{f(k) - \delta k - c}$$

- differential equation in c as a function of k.
- family of solutions.
- optimal solution will cross the steady state.
- at steady state, $\frac{dc}{dk} = \frac{0}{0}$. apply L'hopital, get two solutions. One is stable, the other is not.

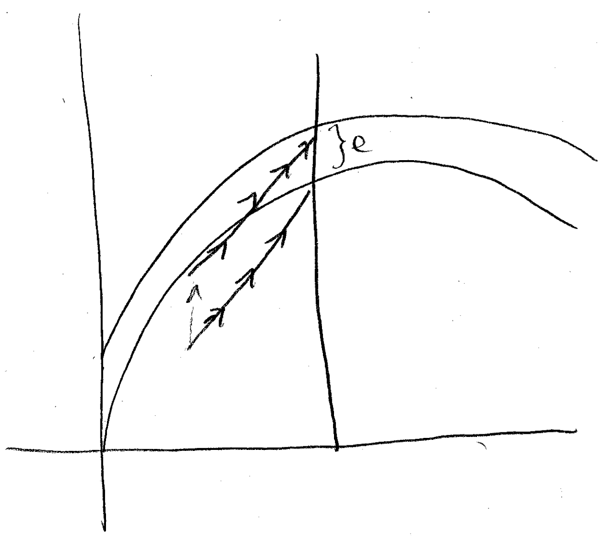
- endowment $e>0$ exogenous. What happens?

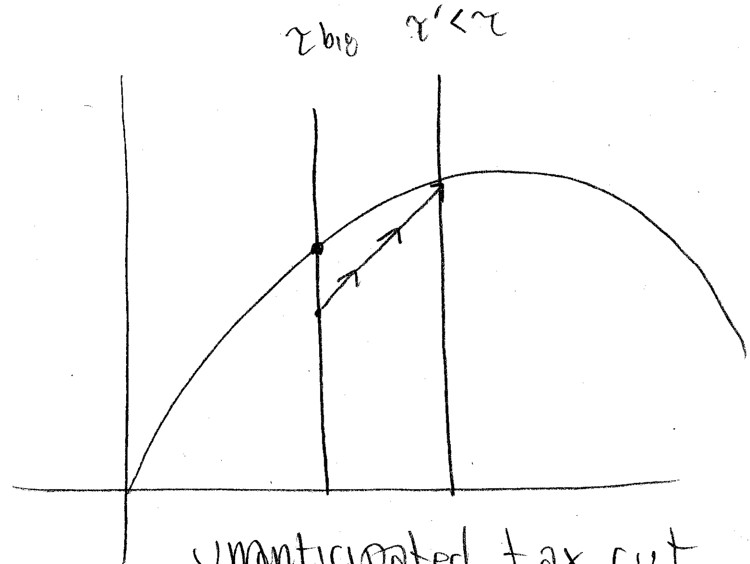
$$c_t^j + k_{t+1}^j = w_t + r_t k_t^j + (1-\delta)k_t^j + e$$

$$k_{t+1} - k_t = f(k_t) - \delta k_t - c_t + e$$

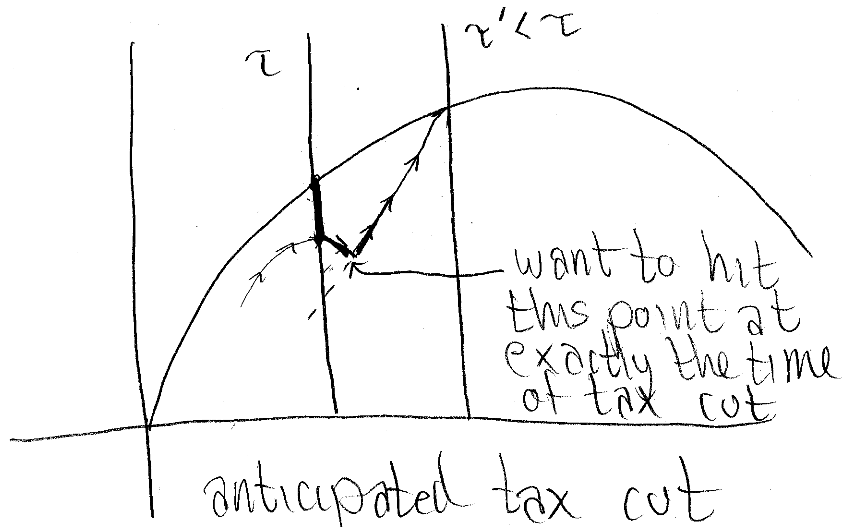
- $\dot{c}$ equation doesn't change
- $\dot{k}$ shifts upward

- alternatively, consider a linear income tax transferred as lump sums back to consumers.





unanticipated tax cut



anticipated tax cut