

Econ720 - TA Session 6

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1. The Growth Model: Discrete Time

Transversality Condition (P13)

$$\lim_{t \rightarrow \infty} \beta^t u'(c_t) k_{t+1} = 0$$

- Best treatments: Kamihigashi (2001, 2002, 2008)
- Intuition
 - Capital should not grow too fast compared to marginal utility
 - If I save too much or spend too little, I'm not behaving optimally

→ TVC prevents capital from exploding

1. The Growth Model: Discrete Time

Transversality Condition (P13) In **infinite horizon** problem, when defining the **solution to planner or household problem**, always remember to write **boundary conditions**: initial condition + TVC (P13, P17)

Why there is no TVC in OLG model?

2. The Growth Model: Discrete Time - Dynamic Programming

Solve the model using

- ① Sequence language
 - Lagrangean: FOC, EE
- ② Recursive formulation/structure
 - (DP) Bellman equation (P9): VF, PF, state/control var., FOC, EC, EE
state variable: everything that is relevant at time t , but cannot be changed anymore is a state

3. The Growth Model: Discrete Time - Competitive Equilibrium

*(P5) How to define **solution** when using

- sequence language
- DP/ recursive formulation

CE vs. **Recursive CE**

	CE	Recursive CE
HH	DP or Lagrangean	DP (P15)
Firm	without/with t (P6)	agg. state var. (P16)
Equilibrium	Same as before (P8)	RCE (P17)

3. The Growth Model: Discrete Time - Competitive Equilibrium

Recursive Competitive Equilibrium

Key feature: **aggregate state**

- HH optimal decision depends on private state and aggregate state

$$k' = h(k, K)$$

- Firm optimal input depends on price which depends on aggregate state

$$q(K), \quad w(K)$$