Introduction to models with endogenous saving

Why do people save (current consumption < current income)?
Some reasons economists have modeled:

1) "Life-cycle saving" for retirement

2) "Intertemporal optimization" given
- positive real interest rate (by giving up a pound of C today, you get (1+r) C tomorrow)
- diminishing marginal utility of C at a point in time (so that you increase average utility of consumption across periods by saving when income especially high to consume more when income is low)

3) "Imperfect financial markets" limit the amount a person can borrow, so:
a) "Precautionary saving" to cover unpredictable expenses or income drops
b) To cover the portion of large predictable expenses that can't be borrowed (e.g. down payment on a house)

4) "Bequest motive" to leave wealth to heirs

Introduction... (cont.)

In this course we'll look at models of 1) & 2).

The models describe people as maximizing "intertemporal utility functions" in which a "good" is consumption at a point in time.

Models will have LRSS, deviations from LRSS like Solow model.

As in Solow, we can ask whether outcome is optimal or not, but our standard can be more than "maximize LRSS consumption":

we can ask whether outcome maxxes utility of people in the model!

Introduction—

Continuous versus discrete time

A model can be set in "continuous" or "discrete" time.

Continuous: $\dot{K}(t) = Y(t) - C(t) - \delta K(t)$ ($\dot{K}$: a continuous variable with $\partial K/\partial t$)

Discrete: $\underbrace{K_{t+1} - K_t}_{\Delta K_{t+1}, \text{ not } \partial K} = Y_t - C_t - \delta K_t$

What determines which one a model uses?

1) Match reality (sometimes relevant time is in discrete periods like days)

2) Mathematical techniques are different

Introduction

Continuous versus discrete...

Phase diagrams

Continuous

$\dot{k}(t) = F(k_t)$

(Solow model)

Discrete

$k_{t+1} = F(k_t)$

(OLG model)