

ECON 421

The Fundamental Inefficiency

Winter 2015

Storage vs. Transfers

We look at two possibilities.

- 1) People can store goods across periods.
- 2) Government can run a transfer scheme.

Utility function:

$$\rho u(c_t(t)) + (1 - \rho)u(c_t(t + 1))$$

where $\rho \in [0, 1]$

The parameter ρ just determines whether people like to consume when young or old.

We can view $(1 - \rho)/\rho$ as a discount factor β .

Efficient Stationary Allocations

Recall that efficient stationary allocation are described by two conditions.

1) Social MRT = MRS

$$n = \frac{u'(c_1)}{\beta u'(c_2)} = \frac{u'(c_1)}{u'(c_2)} \left(\frac{\rho}{1 - \rho} \right)$$

2) Feasibility

$$c_2 = y_2 + n(y_1 - c_1)$$

If $\rho \rightarrow 0$, people would like to have a lot of consumption when old.

How can they best achieve it?

Storage

People can store s_t goods at fixed gross rate of return r .

Optimal storage is given by:

$$\begin{aligned} & \max_{c_t(t), c_t(t+1), s_t} \rho u(c_t(t)) + (1 - \rho)u(c_t(t+1)) \\ & \text{subject to} \\ & c_t(t) + s_t \leq y_1 \\ & c_t(t+1) \leq y_2 + r s_t \end{aligned}$$

Solution is given by a stationary allocation that satisfies:

$$\begin{aligned} r &= \frac{u'(c_1)}{u'(c_2)} \left(\frac{\rho}{1 - \rho} \right) \\ c_2 &= y_2 + r(y_1 - c_1) \end{aligned}$$

Transfers

A government can impose any (lump-sum) transfers.

Consider the transfers $\tau_1(t) = (y_1 - c_1)$ and $\tau_2(t) = -n(y_1 - c_1)$ for all t .

These transfers yield consumption

$$y_1 - \tau_1 = c_1$$

$$y_2 - \tau_2 = y_2 + n(y_1 - c_1) = c_2$$

and, thus, can achieve any per-capita allocation (c_1, c_2) that is feasible.

Of course, these transfers are also feasible in the aggregate

$$N_t \tau_1(t) + N_{t-1} \tau_2(t) = N_{t-1} (n(y_1 - c_1) - n(y_1 - c_1)) = 0,$$

i.e. the government breaks even each period.

Comparing Storage and Transfers

Assumption: Assume that agents are sufficiently patient, so that they want to shift resources into the future (i.e., given (y_1, y_2) , ρ is sufficiently small).

Two options:

1. “Save” or store at r
2. intergenerational transfers from young to old

If $r = n$, the two options are identical.

Why? FOC conditions and the constraints are the same.

If $r > n$ storage is better, whereas for $n > r$ intergenerational transfers are better.

ADD GRAPH

Intuition

People would like to shift resources into the future.

It is better to use the “technology” with the higher MRT.

For $n > r$, one can relax the resource constraint through an intertemporal scheme that pushes the costs indefinitely into the future.

All generations benefit from the scheme, with the initial old facing no costs.

Importantly, the scheme can never stop. Otherwise, some generations will be worse off.

Borrowing vs. Saving

Consider the opposite case where $\rho \rightarrow 1$.

People would like to bring consumption forward.

Here, the economy is **always efficient**.

Why?

- ▶ People cannot borrow from anyone when young.
- ▶ Transfers from the old to the young cannot be Pareto-improving.

Looking forward:

Interest bearing (gov't debt) or non interest bearing assets (money) can improve allocations.