

Economics 6130
Cornell University
Fall 2015
Macroeconomics, I - Part 2

Problem Set #3
Due Tuesday, 11/24/2015

1 Overlapping Generations

Consider the following OLG economy:

2-period lives.

1 commodity per period, $l = 1$.

Stationary endowments:

$$\begin{aligned}\omega_0^1 &= B > 0 \text{ for } t = 0 \\ (\omega_t^t, \omega_t^{t+1}) &= (A, B) > 0 \text{ for } t = 1, 2, \dots\end{aligned}$$

Stationary preferences:

$$\begin{aligned}u_0(x_0^1) &= D \log(x_0^1) \text{ for } t = 0 \\ u_t(x_t^t, x_t^{t+1}) &= C \log(x_t^t) + D \log(x_t^{t+1}) \text{ for } t = 1, 2, \dots\end{aligned}$$

Passive fiscal policy:

$$m_0^1 = 2 \quad m_t^s = 0 \text{ otherwise}$$

Goods price of money is $p^m \geq 0$.

For each of the following cases: Calculate the offer curve for Mr. $t \geq 1$. Precisely plot (use graph paper if necessary) the offer curve in excess demand space $(x_t^t - \omega_t^t, x_t^{t+1} - \omega_t^{t+1})$ for Mr. $t \geq 1$. Plot the reflected offer curve, and analyze the global dynamics.

- (a) $A = 10, B = 12, C = 1, D = 0.98$

- (b) $A = 15, B = 10, C = 2, D = 3$
- (c) $A = 40, B = 30, C = 0.5, D = 0.5$
- (d) $A = 8, B = 4, C = 1.9, D = 0.95$

Is there a pattern?

Derive the conditions on the MRS for a “Samuelson” versus a “Classical” (or “Ricardo”) economy and relate them to the above.

2 Overlapping Generations

Consider the following OLG economy:

Pure exchange, 2-period lives, one consumer per generation.

$$u_0(x_0^1) = x_0^1$$

$$\omega_0^1 = 1, \text{ for } t = 0,$$

$$u_t(x_t^t, x_t^{t+1}) = x_t^t + x_t^{t+1}$$

$$(\omega_t^t, \omega_t^{t+1}) = (1, 1) \text{ for } t = 1, 2, \dots$$

Money transfers:

$$m_0^1 = 2, m_1^1 = -1,$$

$$m_1^2 = 1, m_t^s = 0 \text{ otherwise.}$$

- (a) What is the non-monetary equilibrium allocation? What are the prices? What are the interest rates?
- (b) Derive the reflected offer curve for consumer $t = 1, 2, \dots$
- (c) Derive the set of equilibrium money prices.
- (d) Draw the phase diagram and show the full evolution of this economy (depending on the price of money).
- (e) What is the Pareto optimal allocation associated with the above (money) tax-transfer policy?

- (f) Find an alternative tax-transfer policy and associated allocation which is not Pareto optimal but in which everyone is strictly better off than they would be in autarky.
- (g) Find an alternative tax-transfer policy and associated allocation which is Pareto optimal and in which everyone is strictly better off than they would be in the non-monetary equilibrium.