Economics 6130
Cornell University
Fall 2015
Macroeconomics I - Part 2

Problem Set #2
Due in class Monday, 11/16/2015

Question 1. Static one-good ($l = 1$) pure-exchange economy with money taxes and transfers. Four consumers ($n = 4$) .

$$\omega = (\omega_1, \omega_2, \omega_3, \omega_4) = (10, 8, 4, 2)$$

where $\omega_i > 0$ is the endowment of consumer i ($i = 1, 2, 3, 4$).
For each of the following cases: Is $\tau = (\tau_1, \tau_2, \tau_3, \tau_4)$ balanced? Is τ bonafide? Describe the set of equilibrium money prices.

(a) $\tau = (2, 1, -1, -1)$

(b) $\tau = (5, 2, -3, -4)$

(c) $\tau = (4, -1, 1, -2)$

(d) $\tau = (5, -4, 1, -2)$

(e) $\tau = (0, 0, 0, 0)$

Question 2. Static one-good ($l = 1$) pure-exchange economy. Three consumers ($n = 3$). Endowments are given by

$$\omega = (\omega_1, \omega_2, \omega_3) = (3, 8, 3)$$

Two currencies, R (for Red) and B (for Blue). Let $p^{mR} \geq 0$ and $p^{mB} \geq 0$ be the goods-price of red and blue money, respectively.
For each case (a) through (d), calculate the set of equilibrium prices of red money, blue money, and the equilibrium exchange rate between the two currencies. Do not ignore cases in which one or both moneys are worthless. Please be very careful of units.

(a) $\tau_R = (2, 0, 2),\ \tau_B = (-3, 3, -3)$

(b) $\tau_R = (-1, -1, 2),\ \tau_B = (2, -1, -1)$

(c) $\tau_R = (-2, 7, -2),\ \tau_B = (-1, 0, -1)$

(d) $\tau_R = (2, -2, 2),\ \tau_B = (-1, 4, -2)$

What are the economics behind your answers? Interpret your answers as if $R =$ dollars and $B =$ euros. How are the budget deficits and trade deficits related in this model?

What do you make of the fact that money prices and exchange rates are not always uniquely determined?

Question 3. Offer curve. Single consumer. Two commodities.

$$\begin{aligned} u(x_1, x_2) &= \log x_1 + \beta \log x_2 \\ p &= \frac{p_2}{p_1} \\ \omega_1 &= 150,\ \omega_2 = 75 \\ \beta &= 0.98 \\ z_1 &= x_1 - \omega_1,\ z_2 = x_2 - \omega_2 \end{aligned}$$

Calculate and graph the offer curve (OC) in (z_1, z_2) space.

Question 4. Overlapping Generations. 2 period lives. 1 commodity per period, $l = 1$. Stationary endowments:

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

Stationary preferences:

$$\begin{aligned} u_0(x_0^1) &= 4 \log x_0^1 \text{ for } t = 0 \\ u_t(x_t^t, x_t^{t+1}) &= \log x_t^t + 4 \log x_t^{t+1} \text{ for } t = 1, 2, ... \end{aligned}$$

Taxation:

$$m_0^1 = 10 \qquad m_t^s = 0 \text{ otherwise}$$

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

Derive the offer curve in excess demand space $(x_t^t - \omega_t^t, x_t^{t+1} - \omega_t^{t+1})$ for Mr. $t \geq 1$. Analyze the global dynamics.

Be precise. Find steady-state equilibria. Describe all possible paths. Include in your answer: hyperinflation, hyperdeflation, bursting bubbles, non-bursting bubbles.

Question 5. Inter temporal economies. Perfect borrowing and lending in terms of money. One commodity per period. Two periods. Present prices $p^1 = 1, p^2, p^{m1}, p^{m2}$. Perfect spot markets. No outside money. Rational expectations.

(a) Define equilibrium

(b) Show that, in equilibrium, we have $p^{m1} = p^{m2} = p^m \geq 0$.

(c) Describe fully the economics of (b).

(d) Show that if $p^m > 0$, then the equilibrium allocation to the money-and-spots economy is the same as the equilibrium allocation to the forwards-market economy.

(e) What happens if $p^m = 0$?