

Economics 614: Macroeconomics II

Spring 2006

Cornell University

Problem Set #14

1 More on Money, Taxes and Sunspots

Question 2 in problem set 13 continued.

(a) [High Price-Level Volatility] Choose $P^m(\alpha) = 1$, $P^m(\beta) = 6\frac{1}{2}$ ¹. Based on the numerical values:

(i) Draw the relevant tax-adjusted Edgeworth box.

(ii) Find numerical values of the state contingent allocations for each consumer.

(b) [Price-Level Volatility] Calculate the “supremum” variance in the money prices for (1) the sunspots economy with totally restricted market participation (i.e. $G^0 = \emptyset$), $\sup_{\mathbb{P}_{NP}^m} \text{var}(P^m(s))$, (2) the sunspots economy with partially restricted market participation (i.e. $G^0 = \{1, 2\}$, $G^1 = \{3, 4\}$), $\sup_{\mathbb{P}_{RP}^m} \text{var}(P^m(s))$, and (3) the sunspots economy in which all market participants are unrestricted (i.e. $G^1 = \emptyset$), $\sup_{\mathbb{P}_{FP}^m} \text{var}(P^m(s))$. And establish that

$$\sup_{\mathbb{P}_{NP}^m} \text{var}(P^m(s)) < \sup_{\mathbb{P}_{RP}^m} \text{var}(P^m(s)) < \sup_{\mathbb{P}_{FP}^m} \text{var}(P^m(s)).$$

2 Sunspots and Restricted Participation

(a) Precisely show that the Arrow-securities equilibrium is equivalent to the Arrow-Debreu-contingent claim equilibrium. Be precise and careful with notation. What is the intuition?

(b) Are sunspots equilibrium allocations mere randomization over certainty equilibrium allocations? Back up your claim with examples, not necessarily related to any particular article.

¹You can check that this price bundle is in the equilibrium money price set.

3 Heterogeneous Capital (Continuous Time)

$$\begin{aligned} Y &= C + Z_1 + Z_2 = (K_1 + 32K_2)^{1/3} L^{2/3}, \\ C &\geq 0, Z_1 \geq 0, Z_2 \geq 0, \\ \dot{K}_i &= Z_i - \mu K_i, \\ C &= 0.9Y. \\ K_1(0) &= 10, K_2(0) = 20, L(0) = 100, \\ n &= 0.02, \mu = 0.10. \end{aligned}$$

- (a) Write down the capital evolution equations in per capita units.
- (b) What is the asset-market clearing condition?
- (c) Solve for the steady-state capital labor ratio.
- (d) What is the “better” capital good? Why?
- (e) Show that paths not tending to the steady state will be revealed in finite time to be disequilibrium paths.