ECON4335: Questions for seminar 5. Week 17

16th April 2010

1   Question 1

Consider a one-good, three period economy as in the Diamond-Dybvig model. There is a large number of identical agents. Each agent is endowed with one unit of the good at time $t = 0$ and needs to consume either at $t = 1$ or $t = 2$. With probability π_1 the consumption needs arrive at $t = 1$, with probability $\pi_2 = 1 - \pi_1$ at $t = 2$. There is an independent draw for each agent. Hence, ex post the consumers can be divided in group 1, those who need to consume at $t = 1$ ("the impatient", and group 2, those who will wait to $t = 2$ ("the patient"). Whether an agent is "patient" or "impatient" is private information to the agent.

Consumption of group 1 is C_1, consumption of group 2 is C_2. The utility function,

$$u(C) = \frac{1}{1 - (1/\sigma)} C^{1-(1/\sigma)},$$

is the same irrespective of when the consumption need occurs. There are no consumption needs at $t = 0$. The parameter σ is between zero and one.

The economy has two ways of transferring resources between periods: storage and a long-term investment. Storage is cost-free, but yields no return. A long-term investment of one unit of goods in period 0 gives a gross return $R > 1$ in period 2. If it is liquidated prematurely in period 1, the return is only $0 < \ell < 1$.

1. Find the allocation that maximizes social welfare. How much of the initial endowments will be stored and how much will be invested long-term? Will any long-term investments be liquidated early?

2. Denote the welfare maximizing levels of consumption C_1^* and C_2^*. In the social optimum, who will have the highest consumption, those whose consumption need arrive first or last? Explain why an uneven distribution can be optimal.

3. In the economy there are banks where the agents can deposit their endowments at $t = 0$. For a deposit of 1 the banks offer their customers to return $\tilde{C}_1$ or $\tilde{C}_2$ depending on whether the customer chooses to withdraw at $t = 1$ or $t = 2$. The bank has the same investment possibilities as the individuals. Write down the constraint on $\tilde{C}_1$ and $\tilde{C}_2$ that the bank has

to obey if it is going to be able to honor the deposit contract in the event that consumers withdraw only when they have consumption needs. (You can assume that each bank has a large number of customers). Explain why a bank that offers to return C_1^* or C_2^* will be preferred by all agents relative to any bank that acts differently.

4. Explain why when the banks offer the returns C_1^* and C_2^* there are two equilibria that are consistent with rational behavior of all agents, one where only those with consumption needs at t_1 withdraw at t_1, and one where everyone withdraws at $t = 1$. What are the consumption levels in the latter equilibrium?

5. Suppose that a small group of agents are known by everyone else to be paranoid and therefore expected to withdraw their deposit early in any case. Will there still be two equilibria?

Question 2

Explain why and under what circumstances banks might be tempted to take too risky positions from a social point of view. Discuss one or more actions governments can take to prevent such behavior.