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Economics 614: Macroeconomics II

Spring 2005

Cornell University

Problem Set #13

Due: Monday, May 9

Consider the Diamond-Dybvig model covered in class. Consumers have access to a constant-returns-to-scale investment technology, which allows to transform one unit of the consumption good at $t = 0$ into R units of the good at $t = 2$. If the investment is liquidated at $t = 1$, the return is equal to one unit of the good. Costless storage technology is also available. Assume $R = 1.5$. Individuals maximize expected utility of consumption. Consumers' preferences are given by the constant-relative-risk-aversion utility function $u(c) = \frac{c^{1-s}}{1-s}$, $s = 1.2$. Probability of becoming an early type consumer is $\alpha = 0.3$.

1. No banks. Competitive market for claims on period-one and period-two consumption.

Market opens at $t = 0$ and $t = 1$. Each consumer can decide whether to use the investment technology to produce for his own consumption or for sale of the return on investment in the market. Show that competitive market allocation is equivalent to the autarky allocation. [Hint: Determine competitive prices of $t = 0$ price of period-one consumption, $t = 0$ price of period-two consumption, $t = 1$ price of period-two consumption.]

2. Banks. Solve for the first best, full information (observable types) allocation. Discuss its properties. Do late consumers use storage technology between $t = 1$ and $t = 2$ in this case? Explain.
3. Banks. Can the first best allocation be implemented as a Nash equilibrium even if early/late types are not observable? Explain. Is it a unique equilibrium? Explain.
4. Banks. Solve for the best run proof contract (i.e. the contract that induces a unique, no run, equilibrium). What constraint does it have to satisfy?