ECO 392M: Computational Economics I
Fall 2010, University of Texas
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Problem Set #4b Revised- Due 9/29/10

In this problem set you are to contrast pooling and separating equilibria with bankruptcy.

For parameters, let: preference parameters be given by (coefficient of relative risk aversion $\alpha = 1.5$ and $\beta = 0.8$ - I know it's quite low for an annual model); earnings be given by a two-state Markov process ($y(e) = 1$, $y(u) = 0.05$, $\Pi(s' = e|s = e) = \Pi(s' = u|s = u) = 0.75$); open economy real interest rate ($r = 0.04$); pooling contract borrowing constraint ($\underline{a} = -0.525$); and legal record keeping technology parameter ($(1 - \rho) = 0.1$).

Compute steady state equilibria with pooling and separating contracts. Starting with pooling contracts, the algorithm is a lot like Huggett. In particular, starting with a guess for the pooling price of debt, say q^0, calculate default and asset decisions using the T operator, calculate the implied steady state cross-sectional disribution using the T^* operator, check if the intermediary is making zero profits on its loans (i.e. if $\left| q^0 - \frac{1-\Delta'}{1+r} \right| <$ accepted tolerance) quit otherwise update to q^1 and start over. For the separating equilibrium, start with a guess for the price of debt menu $q^0(a', s)$, calculate default and asset decisions using the T operator (to make the programs run faster, use the same lower bound as above $\underline{a}$ understanding this is not part of the separating contract), then check if the intermediary is making zero profits on each contract, if not update $q^1(a', s)$. Note that when you have finally found the equilibrium price menu of debt, you can then calculate the cross-sectional distribution.

0. Plot value functions for each earnings level with pooling contracts. With separating contracts. Are the value functions strictly concave?

1. Plot borrowing/savings functions for each earnings level with pooling contracts. With separating contracts. What is the economwide debt to income level with pooling contracts? For separating contracts.

2. Plot default decision rules with pooling contracts. With separating contracts. What is the economywide default rate with pooling contracts? For separating contracts?

3. Plot bond prices in the two economies across debt holdings for each earnings level. What is the interest rate for pooling contracts? What is the equilibrium distribution of interest rates across borrowing levels for each earnings type? Note: while the menu is plotted in the first case, the second case should just graph the interest rates which are selected in equilibrium. What is the average interest rate in the separating equilibrium?

4. Plot the equilibrium cross-sectional distribution $\mu(s, a, h)$ for the pooling and separating contract economies.

5. Starting in an economy with pooling contracts, compute compensating variations for the employed and unemployed for each asset position moving to an economy with separating contracts. Graph consumption equivalents for the 4 different types of people (s, h) across a. Who wins/loses from the change to a separating equilibrium? What is the welfare gain or loss?