Problem Set 9

Consider an exchange economy with two consumers, with utility function

$$\sum_{t=0}^{\infty} \beta^t \frac{c_{it}^{1-\sigma}}{1-\sigma}$$

and endowments $\{w_{it}\}_{t=0}^{\infty}$ for $i = 1, 2$. Suppose agents can issue and trade a one-period discount bond every period t. Each of these bonds is bought at a price q_t^b (in units of the consumption good at t) and promises delivery of one unit of the consumption good in period $t + 1$. Let b_{it} denote the number of bonds bought by agent i in period t (so when $b_{it} < 0$ agent i is issuing bonds). Assume that each consumer starts with zero assets in period 0.

1. Write the period-by-period budget constraint for a sequential trade economy and carefully define a competitive equilibrium with sequential trade.

2. Obtain conditions for equilibrium.

3. Show that allocations of consumption are an equilibrium with sequential trade *if and only if* they are an equilibrium with date-0 trade (you may use the characterization of the date-0 trade equilibrium from Problem Set 8).

4. For each of the cases in Question 5 of Problem Set 8, compute the necessary bond trades that implement the date-0 consumption allocations.

5. Write the agent's maximization problem recursively, that is determine state and control variables and provide the Bellman Equation. State clearly any assumption regarding prices you decide to make.