Economics 210C - Macroeconomics | Spring 2018-19

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Consumption Loans Model Exercises

1. Rate of return dominance Consider the consumption loans model, with constant nominal balances $M > 0$. Suppose there exists a storage technology that pays $1 + R$ units of the consumption good at period $t+1$ for each unit of the good stored at t. Assume $R > -1$. In period t, each young agent chooses to store $S_t^d \geq 0$ units of the consumption good, and hold $M_t^d \geq 0$ units of money.

a. Derive the budget constraints at periods t and $t+1$ for agents born at t.

b. Set up the agents' lifetime utility maximization problem, and write down the first-order conditions for optimal interior choices of S_t^d and M_t^d.

c. Use the first order conditions to solve for the steady state equilibrium inflation rate π.

d. Show that a monetary equilibrium exists (i.e., agents choose to hold strictly positive nominal balances) if R is small, but not if R is large. Is there a monetary equilibrium in which agents choose strictly positive storage?

2. Government finance via seignorage Consider a version of the consumption loans model with a government sector. Agents' lifetime utility is given by

$$U(C_{1,t}, C_{2,t+1}) = \ln C_{1,t} + \beta \ln C_{2,t+1},$$

where $0 < \beta < 1$. Assume that $N > 0$ agents are born in each period t (i.e., $n = 0$). The government consumes NG units of the consumption good in each period, where $G > 0$.

a. Derive the symmetric Pareto-optimal allocation of consumption goods across generations (i.e., the allocation satisfies $C_{1,t} = \omega$ for each t).

b. Suppose the government supplies $M > 0$ units of fiat money. In addition, the government finances its purchases in each period by means of a lump-sum tax T on each old agent. Derive the monetary SSE in this case, and show that the equilibrium allocation coincides with the Pareto-optimal allocation.

c. Now suppose that the government finances its purchases by issuing new money; i.e., $M_{t+1} - M_t = P_{t+1}NG$ for each t. Derive the monetary SSE in this case, and show that the equilibrium allocation fails to be Pareto-optimal.