

Assignment 4- due on March 20

In this assignment, you will numerically study some properties of the economy in Aiyagari (1994). To answer the numerical questions, you can modify the set of Matlab programs to compute Bewley economies by LS, available at <ftp://zia.stanford.edu/pub/sargent/webdocs/mitbook/bewley/>. Unless otherwise noted, use the parameter values specified in those programs.

A) Assume that government policy is given by a tax rate on asset income, τ_t , and a lump sum transfer T_t for $t \geq 0$. The transfer T_t can be positive or negative, but it must be the same for all agents. Assume that the government has no outstanding assets or liabilities at time 0, and that there is no government consumption.

i) Define and characterize a competitive equilibrium for this economy. Using the set of Matlab programs to compute Bewley economies by LS, compute the equilibrium for constant asset tax with $\tau = 0, 10\%, 20\%, 30\%$. How does the equilibrium value of assets depend on the capital tax rate? How does the equilibrium wage and labor supply depend on the optimal tax rate? Compute the agents' welfare in the steady state. How does it depend on the optimal tax rate? How do your results depend on the tightness of the borrowing constraint? Compute at the natural borrowing constraint and at other more stringent constraints. (The programs carry out the computation for several values of the borrowing constraint.)

ii) Write down the Ramsey problem for this economy, following the steps in Aiyagari (1995). Compute the optimal capital tax in the steady state. Compute the equilibrium wage and labor supply at the steady state of the Ramsey equilibrium. Compute the agents' welfare at the steady state allocation.

B) Consider the same economy and assume that there is a planner that weighs agents' equally in its' objective function and maximizes their ex ante expected utility by choice of an allocation subject to the resource constraint. Derive the properties of the allocation that solves the planning problem. How could this allocation be implemented in a competitive equilibrium?