

Homework 6, Econ 606

Jonathan Heathcote

Due Tuesday April 18th

Consider the Huggett (1993) economy. Use his benchmark parameter values: period length is two months, $\beta = 0.96$ (annual basis) coefficient of relative risk-aversion $\sigma = 1.5$, $e_h = 1$, $e_l = 0.1$, $\pi(e_h|e_h) = 0.925$, $\pi(e_h|e_l) = 0.5$

Consider a stationary equilibrium.

1. In this equilibrium what is average income, and what is the average duration of an unemployment spell?

Set the borrowing constraint equal to one year's average income. Construct an equally-spaced grid on asset holdings, with a maximum value equal to $3 \times$ average income. Let the number of grid points $N = 20$. Suppose the interest rate $r = 3.4\%$ (annual basis)

2. Use the Euler equation iteration procedure we outlined to solve for optimal decision rules across the grid.¹
3. Imagine one agent, who starts out with zero assets and the high endowment. Simulate the evolution of the agent's wealth, income and consumption for 10,000 periods, each period drawing an endowment according to the Markov process described above (use a random number generator). Plot a histogram for asset holdings over this simulation.
4. Over the last 1,000 periods of this simulation:
 - (a) What is the average value for asset holdings?
 - (b) What is the average decline in consumption in response to entering unemployment?
 - (c) What is the average value for consumption conditional on being (i) employed, (ii) unemployed, (iii) unemployed in the current period and in each of the previous 5 periods (ie unemployed for at least 12 months)?
 - (d) What are the correlations between earnings, income, wealth and consumption?

¹If your decision rules do not appear to guarantee that assets will stay inside the grid, increase the width (upper bound) of the grid.

5. Suppose the net supply of assets is zero (as in the original Huggett paper). What is the market-clearing interest rate?
6. Suppose we were to increase the value for the risk aversion coefficient, σ , from 1.5 to 3. What would happen to
 - (a) the equilibrium interest rate?
 - (b) standard measures for wealth dispersion (eg the Gini coefficient)?

To answer this question you can either speculate on the basis on economic intuition, or actually compute the equilibria for the two economies and report the results.