Advanced Topics in Macro 1
Problem Set 5

Due date: December 1, 2020, at 12.00 noon
Total points: 100 (+10 bonus)

Problem 1. Consider the Aiyagari model with aggregate risk discussed in class. We introduce one modification: unemployment insurance. This is modeled by an unemployment benefit for the unemployed agents which is financed by taxes imposed on the employed agents, i.e., the government solely implements this unemployment insurance scheme and always runs a balanced budget. The exact details and parameters of this model are described in

Wouter J. Den Haan, Kenneth L. Judd, and Michel Juillard. Computational suite of models with heterogeneous agents: Incomplete markets and aggregate uncertainty. *Journal of Economic Dynamics and Control*, 34(1):1–3, 2010.

(a) Solve this model with the Krusell-Smith algorithm using the log-linear forecasting rule with the mean only and stochastic simulation. *[required, 50 points]*

(b) Modify your algorithm to use non-stochastic simulation and compare the precision in terms of Euler equation errors. *[required, 35 points]*

(c) Compute and plot the expected ergodic savings distribution. *[required, 15 points]*

(d) Set the unemployment benefit rate to 0.65 and recompute the model solution. Choose the simulation method with higher precision in (b). Plot the expected ergodic distribution and compare to the base case. *[optional, 10 bonus points]*