Quantitative Macroeconomics & Social Insurance

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Project 6

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Return to code `towards_olg` of Project 5 and take the calibration from project 5. In problem 1 we embed the code into a general equilibrium. Problem 2 considers a pension reform by comparing steady states. In Problem 3 I ask you to extend the code to transitional dynamics.

Problem 1: Extension of Code

- Embed the code into a general equilibrium model. Assume that accidental bequests are taxed at 100% and are not redistributed to the households (they are burned or used up for government consumption G which is otherwise neutral). With this you avoid having to loop over equilibrium bequests.

  Hint: To implement the code in general equilibrium, borrow from the code `exercise`, which gives you the solution of a deterministic general equilibrium OLG model. So, first thing to do is run the code and study it in all details. Then combine the household code from project 5 with the GE code `exercise`.

- Why can an OLG economy be dynamically inefficient? Make sure that the economy is dynamically efficient when there is no pension system.

- Augment the code by a welfare analysis for the life time utility of newborns by calculating the consumption equivalent variation between alternative policy scenarios (that you consider next).

Problem 2: Pension Reform in Steady State Comparison

- Compare the situation of an economy without pension system (`rr=0.0`) to an economy with a relatively generous PAYG pension system that runs a balanced budget (`rr=0.6`). Analyze the welfare consequences for newborns. What do you find? How do the welfare consequences depend on risk aversion, `tetta`? Decompose the welfare effects in partial equilibrium (that is hold interest rates and the gross wage rate constant at the levels in the initial stationary equilibrium, but do clear the government budget) and the remaining general equilibrium effects. What do you find?
- Why is it problematic to compare steady states for this type of policy analysis?

Problem 3: Transitional Dynamics

Extend the code to a version that accounts for transitional dynamics. To do so, you have to do the following:

- Define a maximum time period T
- Assume that the policy reform takes place as a surprise (=zero probability event) in period $t = 1$ so that $rr_0 = 0$ and $rr_t = 0.6$ for all $t = 1, \ldots, T$. Accordingly solve the model in the steady states of $t = 0$ and $t = T$.
- Compute the transition. To do so, you have to solve the policy and value functions of households looping backward in time and the aggregation (i.e., the measures) by looping forward.

First, provide a detailed write-up (=something like a pseudo code) that describes how you would implement the solution. Second, make an attempt to implement the solution.

Problem 4: Literature

Read and briefly summarize Abbott, Gallipoli, Meghir, and Violante (2019).

References

Abbott, B., G. Gallipoli, C. Meghir, and G. L. Violante (2019). Education Policies and Intergenerational Transfers in Equilibrium. forthcoming: Journal of Political Economy.