Monetary Economics and Asset Pricing
Module II
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Homework 2

Please collect your answers into a single pdf file and send it by email. You need to turn in your homework no later than Friday November 18, 2022.

a) Consider a representative agent economy in which one-period and two-period bonds are traded. Both bonds are in zero-net-supply. Agent's utility function is a CRRA of the form $\frac{C^{1-\gamma}}{1-\gamma}$ and his/her budget constraint is:

$$C_t + P_t^{(1)} B_t^{(1)} + P_t^{(2)} B_t^{(2)} \leq \Omega_t + P_t^{(1)} B_{t-1}^{(2)} + B_{t-1}^{(1)}$$

Unlike the case we have done in class, the exogenous endowment shock is a two states Markov process

$$\frac{\Omega_t}{\Omega_{t-1}} = \omega_t \quad \text{with} \quad \omega_t \in \{h, l\}$$

with the following symmetric transition matrix:

$$\Pi = \begin{bmatrix} \phi & 1-\phi \\ 1-\phi & \phi \end{bmatrix}$$

Let $\beta = 0.96$, $\gamma = 2$, $h = 1.05$, $l = 0.97$ and $\phi = 0.3$.

a.i) Compute the yields and illustrate the slope of the two conditional yield curves (be careful in specifying the probabilities over the two periods). Interpret the results.

b) Go to the following link

https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/euro_area_yield_curves

Collect the data of the yields at all maturities for the AAA rated bonds for July 1st, 2020 and July 1st, 2022.

b.i) Plot the two yield curves. Explain their differences and comment on their shape.