Macro PS2

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1 Question 1

We will construct the sequential market structure equilibrium. Each period, we our bond markets contain claims to each "tree".

1.1 Part A

Define q_t^i as the price in period t of a consumption good in period $t+1$ on the condition that consumer i receives an endowment in period $t+1$. $b_t^{i,j}$ is the quantity of that bond demanded by person j.

Each agent maximizes expected utility:

$$\max_{\{c_t^1, b_t^{1,1}, b_t^{2,1}\}_{t=0}^{\infty}} E_0 \sum_{t=0}^{\infty} \beta^t log c_t^1 \tag{1}$$

$$\text{s.t. } c_t^1 + q_t^1 b_t^{1,1} + q_t^2 b_t^{2,1} \leq e_t^1 + b_{t-1}^{1,1} 1\{e_t^1 = 1\} + b_{t-1}^{2,1} 1\{e_t^2 = 1\}$$

$$\max_{\{c_t^2, b_t^{1,2}, b_t^{2,2}\}_{t=0}^{\infty}} E_0 \sum_{t=0}^{\infty} \beta^t log c_t^2 \tag{2}$$

$$\text{s.t. } c_t^2 + q_t^1 b_t^{1,2} + q_t^2 b_t^{2,2} \leq e_t^2 + b_{t-1}^{1,2} 1\{e_t^1 = 1\} + b_{t-1}^{2,2} 1\{e_t^2 = 1\}$$

Market clearing implies the following conditions:

$$b_t^{1,1} + b_t^{1,2} = 0 \tag{3}$$
$$b_t^{2,1} + b_t^{2,2} = 0 \tag{4}$$
$$c_t^1 + c_t^2 = e_t^1 + e_t^2 \tag{5}$$

The competitive equilibrium is a set of prices $\{q_t^1, q_t^2\}_{t=0}^{\infty}$ and allocations $\{b_t^{1,1}, b_t^{2,1}, b_t^{1,2}, b_t^{2,2}, c_t^1, c_t^2\}_{t=0}^{\infty}$ such that agents optimize (1),(2) and markets clear (3),(4),(5).

*I worked on this assignment with my study group: Alex von Hafften, Andrew Smith, and Ryan Mather. I have also discussed problem(s) with Emily Case, Sarah Bass, and Danny Edgel.

1.2 Part B

1.3 Part C

2 Question 2

3 Question 3