ECON 714B - Problem Set 4

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4/16/2021

Problem 1 (50 points)

Suppose that an infinitely lived government has to finance a fixed stream of expenditures, $\{g_t\}_{t\geq 0}$ and can only use consumption taxes for this purpose. Assume that the representative consumer has the utility function:

$$\sum_{t=0}^{\infty} \beta^t \left[\frac{c_t^{1-\sigma}}{1-\sigma} + v(\ell_t) \right]$$

where c_t is the consumption in period t and ℓ_t is leisure in period t. Assume that $\sigma > 0$ and v is an increasing function. Also assume that the production function, $F(K, L)$ satisfies all the standard assumptions (i.e., CRS, etc.), that the representative household has an initial endowment of the capital stock,$k_0, \ell_t \leq 1$ and that capital is subject to the usual law of motion, $k_{t+1} = (1-\delta)k_t + x_t$. Set up the Ramsey Problem for this economy, and show that the optimal policy is to set the consumption tax at a constant rate from period one onwards (i.e., show that $\tau_{ct}^{RP} = \tau_{ct+1}^{RP}$ for all $t > 1$.

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*I worked on this problem set with a study group of Michael Nattinger, Andrew Smith, and Ryan Mather. I also discussed problems with Sarah Bass, Emily Case, Danny Edgel, and Katherine Kwok.

Problem 2 (50 points)

Consider a cash-credit goods economy with preferences given by

$$\log c_{1t} + \alpha \log c_{2t} + \gamma \log(1 - n_t)$$

where n_t is the time spent in market activities. The resource constraint is

$$c_{1t} + c_{2t} = n_t$$

The cash-in-advance constraint is

$$p_t c_{1t} \leq M_t$$

The budget constraint for the HH at the beginning of the period is

$$M_t + B_t \leq (M_{t-1} - p_{t-1}c_{1t-1}) - p_{t-1}c_{2t-1} + w_{t-1}n_{t-1} + R_{t-1}B_{t-1} - T_t$$

where T_t denotes lump-sum taxes and all the terms are as we discussed in class. The government conducts monetary policy to keep the interest rate fixed at some level R in all periods.

1. Define a competitive equilibrium.

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2. What happens to n_t as R increases. Prove your result.

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