ECON 602 - Macroeconomic Analysis II

Comprehensive Exam

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Note that the timing convention of these questions are different from the one adopted in Spring 2008 and later.

3. Consider a **standard** cash-good-credit-good model, with the **standard** timing where the securities market opens first in a given period where a one-period nominal bond is traded and claims for credit purchases are settled, followed by simultaneous factor and goods markets. The only **nonstandard** aspect of consumers is that they have **habit persistence**, which means their past consumption affects their current utility, typically negatively. (Once you start consuming a certain amount, consuming less makes you worse off.) For now, let's just say their utility function is $u\left(c_{1t}, c_{1,t-1}, c_{2t}, c_{2,t-1}, 1-h_t\right)$. There is no capital in the model. Firms are **standard** as well. A_t denotes a **stochastic** aggregate technology shock with law of motion $A_{t+1} = A\left(A_t\right)$. Government expenditures are constant over time at G. The government levies **two** taxes: a labor income tax τ_t^h **and** a consumption tax τ_t^c which is applied at the same rate for both types of consumption. If you're in doubt about any aspect of the environment, **state** and make the most **standard** assumption you can think of. [The questions below will be unusually nonstructured (for my exams), so make an effort to keep your answers structured.]

The equation below may be useful at some point

$$E_0 \sum_{t=0}^{\infty} \beta^t \left\{\left[u_1\left(t\right) + \beta u_2\left(t+1\right)\right] c_{1t} + \left[u_3\left(t\right) + \beta u_4\left(t+1\right)\right] c_{2t} - u_5\left(t\right) h_t\right\} = \Xi \tag{1}$$

a. (30 points) Define competitive equilibrium.

For the rest of the question, you may use

$$u\left(c_{1t}, c_{1,t-1}, c_{2t}, c_{2,t-1}, 1-h_t\right) = c_{1t}c_{2t} - \alpha c_{1,t-1}c_{2,t-1} + B\left(1-h_t\right) \tag{2}$$

for $0 < \alpha < 1$ and $B > 0$, although it may be more convenient to keep the general notation.

b. (23 points) Characterize the optimal policy.

c. (23 points) Characterize the optimal policy when $\tau_t^h = 0$ is a constraint on the Ramsey planner.

d. (24 points) Characterize the optimal policy when $\tau_t^h = \tau_t^c = 0$ is a constraint on the Ramsey planner.