Problem Set 4: Cash-in-Advance Model

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1 CIA Model

Demographics: A single, infinitely lived household.

Preferences: $\sum_{t=0}^{\infty} \beta^t U(c_t, h_t)$. c is consumption; h is land.

Endowments: At $t = 0$: M_0 units of money, k_0 units of goods, H units of land.

Technology: $c_t + k_{t+1} = Rk_t + F(h_t)$. F satisfies Inada conditions. $R > 1/\beta$ is exogenous.

Government: prints money and hands it out as lump sum transfer: $p_t \tau_t = M_{t+1} - M_t$.

Markets: competitive markets for goods (p_t), land purchase (q_t), land rental (r_t), money (numeraire).

CIA constraint: $c_t \leq m_t = M_t/P_t$.

Questions:

1. Write down the household budget constraint.
2. Write down the household's Bellman equation.
3. Write down the first-order conditions and envelope conditions.
4. Eliminate the value functions from those conditions.
5. Interpret the resulting first-order conditions.
6. What can be said about the relative returns of the three assets when the CIA constraint does not bind?
7. Derive and interpret the condition

$$U_c = \beta R U_c(.') \frac{\pi}{\pi'} \tag{1}$$

   What happens to the intertemporal allocation of consumption when the inflation rate is rising over time? Why?