Problem Set 4: Cash-in-Advance Model

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1 Shopping time

Demographics: There is a single representative household who lives forever.

Preferences: The household values consumption (c) and leisure (l) according to

$$\sum_{t=0}^{\infty} \beta^t u(c_t, l_t); \qquad 0 < \beta < 1.$$

Endowments: In each period, the agent is endowed with 1 unit of time that can be used for leisure (l), work (n), and shopping (s):

$$1 = l_t + n_t + s_t$$

The household is endowed with k_0 units of capital and M_0 units of money in period 0.

Technology: The transactions technology is such that s_t units of time are required to purchase c_t given money balances $m_t = M_t/P_t$:

$$s_t = g(c_t, m_t)$$

where P_t is the price of the good. Obviously, $g_c > 0$ and $g_m < 0$.

Goods are produced from capital and labor with the production function $f(k_t, n_t)$, which has nice properties. The resource constraint is $f(k, n) + (1 - \delta)k = c + k'$.

Markets: The usual markets for goods, money, capital and labor rental operate. There is no government and the money supply is constant.

Questions:

1. Define a solution to the household problem.

2. Define a competitive equilibrium.

3. Is money neutral in this economy? Prove your answer using the system of equations that define a competitive equilibrium.

4. Would money still be neutral if the transactions technology used nominal money balances i.e., $s_t = g(c_t, M_t)$? Explain the intuition. You need not derive your answer.