Economics 314 Spring 2019

Daily Problem #23 March 13

The utility function in Romer's new Keynesian *IS/LM* model is

$$\mathcal{U} = \sum_{t=0}^{\infty} \beta^t \left[U(C_t) + \Gamma\left(\frac{M_t}{P_t}\right) - V(L_t) \right],$$

with

$$U(C_t) = \frac{C_t^{1-\theta}}{1-\theta} \text{ and } \Gamma\left(\frac{M_t}{P_t}\right) = \frac{\left(M_t / P_t\right)^{1-\nu}}{1-\nu}.$$

The budget constraint is

$$\frac{A_{t+1}}{P_{t+1}}(1+\pi_{t+1}) = \left(\frac{A_t}{P_t} + \frac{W_t}{P_t} L_t - C_t\right)(1+i_t) - i_t \frac{M_t}{P_t}.$$

1. Suppose that real money holding M_t/P_t goes up by one unit. According to the budget constraint, how much must current consumption C_t go down to keep the budget in balance if nothing else changes? (This is the relative price of money holding in terms of consumption.)

2. What is the marginal utility of an additional unit of real money at time t, $\frac{\partial \mathcal{U}}{\partial\left(M_t / P_t\right)}$?

3. What is the marginal utility of an additional unit of consumption at time t, $\frac{\partial \mathcal{U}}{\partial C_t}$?