Econ702
Spring 2020
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Homework 10

1. Consider the simple sticky price New Keynesian model as presented in the textbook. Suppose that the economy is driven into a recession caused by an exogenous reduction in A_t.

   (a) Draw five graphs (as in the textbook) to show the short run effects of the reduction in A_t on the endogenous variables of the model. Include in your graphs what happens to the flexible price, neoclassical values of the endogenous variables.

   (b) What pressure will there be on the position of the AS curve as the economy transitions from short run to medium run?

   (c) Plot responses of A_t, Y_t, P_t and r_t to a shock over t. Use the framework in the textbook in splitting period (Assume there are three periods: 1, 2 and 3. A shock hits at period 1. The price level fully adjusts at period 3.)

   (d) An observer looking at data generated from this model will observe a particular correlation between inflation and output conditional on shock to A_t. Is that correlation consistent with the idea of the Phillips Curve as presented in the textbook?

   (e) If you look at the correlation between inflation and output gap (instead of output) conditional on shock to A_t, is that correlation consistent with the idea of the Phillips Curve as presented in the textbook?

2. Consider a sticky price New Keynesian model. Suppose that the equation of the demand side are given as follows:

$$C_t = c_1(Y_t - G_t) + c_2(Y_{t+1} - G_{t+1}) - c_3 r_t$$

$$I_t = -b_1(r_t + f_t) + b_2 A_{t+1} - b_3 K_t$$

$$M_t = P_t - m_1(r_t + \pi^e_{t+1}) + m_2 Y_t$$

   Here, c_1,c_2 and c_3 are positive parameters, as are b_1, b_2 and b_3 and m_1 and m_2. Government spending G_t is exogenous.

   (a) Derive an algebraic expression for the AD curve.

   (b) Find an expression for how Y_t will react to an increase in f_t when the price level is fixed at $\bar{P}_t$.

   (c) Solve for an expression for how much $\bar{P}_t$ must adjust to keep Y_t fixed after an increase in f_t (as it would in the neoclassical model). Verify that the required increase in $\bar{P}_t$ is positive.