The Macroeconomic Policy Model

Additional Homework Problems

ECON 3133

Dr. Keen

1. In this problem, we consider the behavior of the economy following a recession. We look at how the recovery is influenced by the model used for inflationary expectations. Suppose the economy starts off with output at potential ($Y = Y^*$) and $\pi = 0.02$. The macroeconomic policy equation is given by

$$(Y - Y^*)/Y^* = -[\beta_\pi/(\beta_Y+\sigma)]\times(\pi - \pi^*) - [1/(\beta_Y+\sigma)]\times(r^* - r^{e}*),$$

with $\sigma = 0.1$, $\beta_\pi = 0.5$, $\beta_Y = 0.5$, $\pi^* = 0.02$ and $r^* = r^{e}* = 0.02$. The price adjustment equation is given by

$$\pi = \pi^e + f\times[(Y_{-1} - Y^*)/Y^*],$$

with $f = 0.25$. In year 1, the Fed lowers its target inflation rate to zero (i.e., $\pi^* = 0$) which causes a recession.

   a. Calculate the path of inflation and output in years 1 thru 6, assuming 1) $\pi^e = \pi_{-1}$ and 2) $\pi^e = 0.4\times\pi_{-1} + 0.2\times\pi_{-2}$.

   b. For which model of expectations does the return to potential output take longer?

   c. We assumed here that the value taken by f in the price adjustment equation was the same for both models of inflationary expectations. Explain why in reality the value of f might differ from one model to the other.

2. Describe the short-run and long-run behavior of investment and interest rates during a boom that was created by an increase in autonomous investment. Assume that the central bank targets the nominal interest rate via a Taylor rule.

3. Suppose that the public uses all available information to make unbiased, but not error free, forecasts of inflation. In that case, we can say that

$$\pi_t = \pi^e_t + e_t,$$

where e_t is a forecast error whose average value is zero.

   a. What does this relationship between π and π^e imply about the average value of the output gap? (Hint: use the price adjustment equation)

   b. Suppose now that π^e was formed so that π^e always differed from π by a constant, e, using the price adjustment equation, show that the accelerationist hypothesis doesn't hold.