

(14.02 PRINCIPLES OF MACROECONOMICS

PROBLEM SET 6

DUE: WEDNESDAY 9 APRIL 1997

(1) Suppose the Phillips curve in an economy is given by the equation

$$\pi_t = \pi_t^e + 7.5 - 1.15u_t,$$

where $\pi_t^e = \pi_{t-1}$ (note this is similar to equation 17.5 in Blanchard)

Further, suppose that in period $t-1$, the unemployment rate is equal to the natural rate, and that the inflation rate is 0 percent.

- a. What is the natural rate of unemployment in this economy?
- b. Suppose that beginning in period t , the authorities bring the unemployment rate down to 5% and keep it there indefinitely. Determine the rate of inflation in periods t , $t+1$, $t+2$, and $t+3$ when $\theta=0$. Then do the same for $\theta=1$.
- c. For which of the two values of θ does $u_t < u_n$ imply an acceleration of the price level (a continually increasing rate of inflation)?
- d. Suppose the authorities do not know what the natural rate of unemployment is. Can they find out what it is? How?

(2) Suppose that the Phillips curve is as specified in problem 1 (with $\theta=1$). In period $t-1$, unemployment is at its natural rate, and the inflation rate is zero. Beginning in period t , two things happen:

(1) The authorities move the actual unemployment rate to 5% and keep it there.

(2) Half of all workers sign indexed labor contracts.

a. Give the new equation for the Phillips curve.

b. Calculate the inflation rates in period t , $t+1$, and $t+2$.

c. Comparing your answers to questions 1b and 2b, what does indexing imply about the impact of maintaining the unemployment rate below the natural rate?

(3) TRUE or FALSE, then COMMENT ON STATEMENT. "Wage indexation reduces the ability of authorities to use contractionary fiscal policy to reduce inflation."

(4) TRUE or FALSE, then COMMENT ON STATEMENT. "If, on average, workers correctly anticipate the price level that prevails over the life of their wage contracts (i.e., the labor market is characterized by rational expectations), then the unemployment rate never deviates from the natural rate."

(5) If the United States experienced three or four years of low (under 1%) inflation, would it return to the original Phillips curve of the 1950s and 1960s?

(6) The current rate of inflation has been hovering around 5.2% and the rate of inflation has been stable. If the natural rate of unemployment in the United States is 6%, is it surprising that the rate of inflation has not been increasing?

(7) During the 1970s the price of oil increased. What might have been the probable effect of this on the natural rate of unemployment?

(8) Consider the conventional AS and AD relationships, with backward looking expectations (described by equations 16.3 and 16.4 in Blanchard). Assume the intersection of AS and AD is at (P_n, Y_n) . Weather patterns permanently change for the worse (e.g., non-stop blizzards), reducing the nation's capital stock permanently. Assume that the government and private investors are too stunned to respond to this change, and therefore do nothing to increase their expenditure.

a. Does this surprise change in weather patterns affect WS, PS, IS or LM? Does it affect Y_n ?

b. Show graphically and describe in words the immediate impact on AS and AD; label this new short-run equilibrium (P', Y') . What is the short-run impact on price level and output? Show graphically using AS/AD the transition from (P', Y') to the long-run equilibrium.

Consider the conventional AS and AD relationships, with backward looking expectations (described by equations 16.3 and 16.4 in Blanchard). Assume the intersection of AS and AD is at (P_n, Y_n) .

Weather patterns permanently change for the worse, reducing the nation's capital stock. Assume that the government responds to this crisis immediately, increasing its expenditure on infrastructure investment so that, despite the change in weather patterns, in the short-run output is left unchanged.

c. Which of the following are affected by the change in weather patterns coupled with fiscal expansion: WS, PS, IS or LM? Is Y_n affected?

d. Show graphically and describe in words the immediate impact on AS and AD; label this new short-run equilibrium (P'', Y'') . What is the short-run impact on price level and output? Show graphically using AS/AD the transition from (P'', Y'') to the natural rate of output. Describe in words this transition from (P'', Y'') to long-run equilibrium.