

14.02 Introduction to Macroeconomics
Solutions to Problem Set 6

1a) $U_n = 6.5$

b) $\theta = 0 \quad \theta = 1$

$\pi_t \quad 1.75 \quad 1.75$

$\pi_{t+1} \quad 1.75 \quad 3.5$

$\pi_{t+2} \quad 1.75 \quad 5.25$

$\pi_{t+3} \quad 1.75 \quad 6.00$

c) $\theta = 1$

d) If $\theta > 0$ then inflation will rise whenever $U_t < U_n$ and fall whenever $U_t > U_n$. So if the authorities experiment with different levels of unemployment and find one which does not lead to either a rise or a fall in inflation. This is the natural rate.

2a) $\pi_t = \pi_{t-1} + 15 - 2.3U_t$

b) $\pi_t = 0 + 15 - 2.3 * 5 = 3.5, \pi_{t+1} = 3.5 + 15 - 2.3 * 5 = 7$

$\pi_{t+2} = 7 + 15 - 2.3 * 5 = 10.5$

c) $U_t < U_n$ will imply a larger change in π if wages are indexed than if they are not

3) False. A contractionary fiscal policy will cause U to rise above U_n . This will result in a fall in inflation. For a given rise in unemployment the fall in inflation will be larger if wages are indexed. Therefore it will be easier to reduce inflation.

4) False. On average the unemployment rate will equal the natural rate. But unemployment can deviate from the natural rate on a temporary basis, if workers expectation turn out to be wrong in a particular period. Rational expectations does not imply that workers are always correct. It implies only that they are correct on average.

5) No. The Phillips curve of the 1960s existed because workers assumed that there was never going to be inflation i.e. $\pi^e = 0$. It is unlikely that this will ever occur again i.e. modern workers will tend to have expectation that inflation will be as it was last year i.e. $\pi_t^e = \pi_{t-1}$. We know from question one that these two different methods of forming expectations have

very different implications for the relationship between unemployment and the rate of inflation.

6) Yes, it is surprising. Some economists have speculated that the natural rate of unemployment has fallen. This would explain why inflation has not risen even with unemployment below 6%

7) The natural rate probably rose. The increase in the price of oil is equivalent to a rise in μ . This causes the price setting curve to fall in $(W/P, U)$ space leading to a rise in the natural rate.

8a) It affects the PS curve. Reducing the capital stock will cut production for a given level of employment. Firms produce less output per worker, can afford to pay workers less. This causes the price setting curve to fall, leading to a rise in the natural rate of unemployment.

b) The AS curve shifts to the left. There is a new equilibrium at higher prices and lower output. This a long run equilibrium, there is no further adjustment. The supply shock has caused the natural level of output to fall. Therefore there is no pressure for wages and prices to fall.

c+d) The loss of the capital affects the wage setting and aggregate supply curve as before. The increase in government expenditure shifts the IS curve to the right in (i, y) space. This in turn causes the AD curve to shift to the right. The new equilibrium is short run. Because of the fiscal expansion, output is above the new lower natural rate. Prices will rise, causing the AS curve to shift left. The new long run equilibrium will have output equal to the new (lower) natural level and prices will have risen.