Part 1:
Olivier Blanchard, David Johnson, Macroeconomics.

Chapter 11, Pages 212-213, Questions 1, 3, 4, 5.

Quick Check

Using the information in this chapter, label each of the following statements true, false, *or* uncertain. *Explain briefly.*

a. The original Phillips curve is the negative relation between unemployment and inflation first observed in the U.K.

b. The original Phillips curve relation has proven to be very stable across countries and over time.

c. The aggregate supply relation is consistent with the Phillips curve as observed before the 1970s, but not since.

d. Policy makers can only exploit the inflation-unemployment trade-off temporarily.

e. Before the 1970s, there was no natural rate of unemployment, and policy makers could achieve as low a rate of unemployment as they wanted.

f. The expectations-augmented Phillips curve is consistent with workers and firms adapting their expectations following the macroeconomic experience of the 1960s.

2. *Discuss the following statements:*

a. The Phillips curve implies that when unemployment is high, inflation is low and vice versa. Therefore, we may experience either high inflation or high unemployment, but we will never experience both together.

b. As long as we do not mind having high inflation, we can achieve as low a level of unemployment as we want. All we have to do is increase the demand for goods and services by using, for example, expansionary fiscal policy.

3. *Mutations of the Phillips curve*

Suppose that the Phillips curve is given by

$$\pi_t = \pi_t^e + 0.1 - 2u_t$$

where

$$\pi_t^e = \theta\,\pi_{t-1}$$

Also, suppose that θ is initially equal to zero.

a. What is the natural rate of unemployment?

Suppose that the rate of unemployment is initially equal to the natural rate. In year t the authorities decide to bring the unemployment rate down to 3% and hold it there forever.

b. Determine the rate of inflation in years t, $t+1$, $t+2$, $t+5$.

c. Do you believe the answer given in (b)? Why or why not? (*Hint*: Think about how people are likely to form expectations of inflation.)

Now suppose that in year $t+5\theta$ increases from 0 to 1. Suppose that the government is still determined to keep u at 3% forever.

d. Why might θ increase in this way?

e. What will the inflation rate be in years $t+5$, $t+6$, $t+7$?

f. Do you believe the answer given in (e)? Why or why not?

4. *Oil shocks, inflation, and unemployment*

Suppose that the Phillips curve is given by

$$\pi_t - \pi_t^e = 0.08 + 0.1\mu - 2u_t$$

where μ is the markup of prices over wages.

Suppose that μ is initially equal to 20%, but that as a result of a sharp increase in oil prices, μ increases to 40% in year t and after.

a. Why would an increase in oil prices result in an increase in μ?

b. What is the effect of the increase in μ on the natural rate of unemployment? Explain in words.

Dig Deeper

5. *The macroeconomic effects of the indexation of wages*

Suppose that the Phillips curve is given by

$$\pi_t - \pi_t^e = 0.1 - 2u_t$$

where

$$\pi_t^e = \pi_{t-1}$$

Suppose inflation in year $t-1$ is zero. In year t, the authorities decide to keep the unemployment rate at 4% forever.

a. Compute the rate of inflation for years t, $t+1$, $t+2$, and $t+3$.

Now suppose that half the workers have indexed labor contracts.

b. What is the new equation for the Phillips curve?

c. Answer (a) again.

d. What is the effect of wage indexation on the relation between π and u?

6. *The price of oil has substantially declined in the 1990s.*

a. Can this help explain the evidence on inflation and unemployment in the 1990s, presented in this chapter?

b. What has been the likely effect on the natural rate of unemployment?

Explore Further

7. *Estimating the natural rate of unemployment*

To answer this question, you will need data on the annual U.S. unemployment and inflation rates since, 1970, which can be obtained from the Web site of the Bureau of Labor Statistics: **stats.bls.gov/data/**

Select the "most requested series." Under "Employment and Unemployment," pick "Labor force statistics from the Current Population Survey" and make an extract of the "Unemployment Rate—Civilian Labor Force." This is a monthly series, so use the year's average for that year's unemployment rate.

Similarly, under the "most requested series," look under "Prices and Living Conditions" and make an extract of the "Consumer Price Index—All Urban Consumers." Define the inflation rate in year t as the percentage change in the CPI between year t and year $t-1$. Once you have computed the rate of inflation for each year, compute also the change in the inflation rate from one year to the next.

Part 2:

Chapter 12, Questions 1, 2, 3, 4, and 6.

7- Suppose that the Phillips curve is given by: $\pi_t = \pi_t^e + K - 2\, u_t$
where K is a constant and that $\pi_t^e = \pi_{t-1}$

Suppose that initially unemployment is equal to the natural rate and $\pi = 12\%$. The authorities decide in year t that 12% inflation is too high and that they will maintain unemployment rate 1 percentage point above the natural rate of unemployment until the inflation rate des to 2%.

a)- Solve for the natural rate of unemployment as a function of the constant K. What is the sacrifice ratio? How does the sacrifice ratio depend on the natural rate of unemployment?

b)- Compute the rate of inflation for years t and t+ l. (Hint: Express the Phillips curve as a function of the difference between the current unemployment rate and the natural rate of unemployment.)

c)-For how many years must the authorities keep the unemployment rate above the natural rate of unemployment? Is the implied sacrifice ratio consistent with your answer to (a)?

Now suppose that people know that the authorities to lower inflation to 2% but they are not sure of the authorities willingness to accept an unemployment rate above the natural rate of unemployment. So, their expectation of inflation is a weighted average of the target of 2% and the last year's inflation, that is:

$$\pi_t^e = b\ 2\% + (1\text{-}b)\ \pi_{t-1}$$

where *b* is the weight they put on the government's target of 2%.

d)- Let b = 0.25. How long will it take before the inflation rate is no higher than 2%? What is the sacrifice ratio now?

e)- Suppose that after the government's policy has been in effect for one year, people believe the authorities completely. So, they now set their expectations according to: $\pi_t^e = 2\%$
From what year onward can the authorities let the unemployment rate return to the natural rate?

f)- What advice would you give to a policy maker interested in lowering the rate of inflation by increasing the rate of unemployment as little and for as short a time period as possible?