SGPE Summer School
Macro Problem Set 8

Aggregate Supply
Mankiw, Chapter 13

8^{th} August 2013

Short answer questions

(1) How is the Phillips curve related to aggregate supply?

(2) Under what circumstances might it be possible to reduce inflation without causing a recession?

Problems

Question 1

In the sticky-price model, the equation for the short-run aggregate supply curve is:

$$P = EP + \left[\frac{(1-s)\,\alpha}{s}\right]\left(Y - \overline{Y}\right)$$

where s is the fraction of firms with sticky prices and $\alpha > 0$.

(a) What is the slope of this curve?

(b) Calculate the derivative of this expression with respect to s and discuss what this tells us about how the fraction of firms with sticky prices affects the steepness of the short-run aggregate supply curve. (You may treat both EP and $\bar{Y}$ as constants.)

Question 2

Suppose that an economy has the Phillips curve

$$\pi = \pi_{-1} - 0.5(u - u^n),$$

and that the natural rate of unemployment is given by an average of the past two years' unemployment:

$$u^n = 0.5(u_{-1} + u_{-2}).$$

(a) Why might the natural rate of unemployment depend on recent unemployment (as is assumed in the preceding equation)?

(b) Suppose that the Fed follows a policy to reduce permanently the inflation rate by 1 percentage point. What effect will that policy have on the unemployment rate over time?

(c) What is the sacrifice ratio in this economy? Explain.

(d) What do these equations imply about the short-run and long-run tradeoffs between inflation and unemployment?

Question 3

Suppose that the economy is initially at a long-run equilibrium. Then the central bank increases the money supply.

(a) Assuming any resulting inflation to be unexpected, explain any changes in GDP, unemployment, and inflation that are caused by the monetary expansion. Explain your conclusions using three diagrams: one for the *IS–LM* model, one for the *AD–AS* model, and one for the Phillips curve.

(b) Assuming instead that any resulting inflation is expected, explain any changes in GDP, unemployment, and inflation that are caused by the monetary expansion. Once again, explain your conclusions using the same three diagrams.