

## Chapter 12

# Aggregate Supply, Aggregate Demand, and Inflation: Putting It All Together

*Macroeconomics In Context (Goodwin, et al.)*

### Chapter Overview

This chapter introduces you to the "Aggregate Supply Response/Aggregate Demand Equilibrium" (or "ASR/ADE") model. It introduces the inflation rate to the aggregate demand model presented previously in Ch. 9. Now, however, the aggregate demand curve is an Aggregate Demand Equilibrium (ADE) curve and is downward sloping in relation to inflation and output. The chapter also adds in the role of aggregate supply by presenting an Aggregate Supply Response (ASR) curve. The ASR/ADE model is then deployed to analyze various current events (such as changes in fiscal and monetary policy, supply shocks, and other changes) and examines their effects on the rate of inflation and output. The chapter reviews several decades of U.S. macroeconomic performance through the lens of the ASR/ADE model. It also compares the classical school with their view of full employment equilibrium, to the Keynesians with their view of a dynamically evolving economy. Lastly, you will be introduced to considerations of social and ecological sustainability and their implications for the ASR/ADE model.

### Chapter Objectives

After reading and reviewing this chapter, you should be able to:

1. Explain the derivation of the Aggregate Demand Equilibrium curve relating inflation and output levels, and how it shifts.
2. Explain the derivation of the Aggregate Supply Response curve relating inflation and output levels, and how it shifts.
3. Use the ASR/ADE model to describe the consequences of changes in fiscal policy, monetary policy, supply shocks, and investor and consumer confidence, depending on whether an economic is in a recession or at full employment.
4. Apply the ASR/ADE model to understanding major U.S. macroeconomic developments of the last several decades.
5. Discuss how classical and Keynesian economic theories differ in how they understand the macroeconomy.
6. Examine the assumptions of the aggregate demand models covered in Chapters 9-12, in light of concerns for social and ecological sustainability.

## Key Terms

maximum capacity output  
wage-price spiral  
wage and price controls  
supply shock  
stagflation

*Appendix:*  
real business cycle theory  
rational expectations school  
New Keynesian macroeconomics  
Post Keynesian macroeconomics

## Active Review

### *Fill in the Blank*

1. The curve that represents various equilibrium points that are consistent with various levels of inflation, and shows an inverse relationship between inflation and output, is called the \_\_\_\_\_ curve.
2. If inflation is on the rise, the Fed will raise interest rates, thereby reducing output (and vice versa, if inflation is falling). This action describes the \_\_\_\_\_ rule.
3. The curve that shows the combination of output and inflation that can occur in an economy, given the country's capacity constraints, is called the \_\_\_\_\_ curve.
4. Assume that a nation is fully using every last one of its available resources in production. Then that nation would be operating at \_\_\_\_\_ output.
5. When demand for labor and other resources is high, and that bids up wages, which in turn bids up prices as producers try to cover their higher cost of production, which then puts further upward pressure on wages as workers demand compensation for higher prices, etc., the result is what is called a \_\_\_\_\_.
6. At least two times in U.S. economic history, during WWII and the early 1970s, the government established \_\_\_\_\_ to keep inflation from spiraling out of control.
7. Something that changes the ability of an economy to produce goods and services (such as a natural disaster, a war, change in productivity, or change in the price of a key input like oil) is called a \_\_\_\_\_.
8. The presence of both economic stagnation (with rising unemployment) and rising inflation is known as \_\_\_\_\_.
9. Suppose people experience a higher level of inflation for a period of time, and begin to build in that higher rate of inflation into their contracts. This would be characterized as an increase in \_\_\_\_\_.

10. Some economists concerned with the environment point out that one can keep the level of spending constant, but change the \_\_\_\_\_ of spending, in ways that can help the environment.

11. (In appendix) The theory that changes in employment levels are caused by change in technological capacities or people's preferences concerning work is a theory associated with \_\_\_\_\_.

12. (In appendix). The theory that said that people will use all available information, including rational anticipation of the Fed's monetary policy movements, and will immediately incorporate changes in inflationary expectations into their contracts, is associated with the \_\_\_\_\_.

13. (In Appendix) The economists who believe that the Keynesian view holds in the short and medium run, but the classical view prevails in the long run, have proposed a \_\_\_\_\_.

14. (In Appendix) The school of thought which bases their analysis on rational, optimizing individuals and micro-level market behavior, but believes that the adjustment to full employment equilibrium could take a relatively long time, is called \_\_\_\_\_.

15. (In Appendix) The school of thought that believes that economies are unstable, that history matters, and that the future is often unpredictable, is called \_\_\_\_\_.

#### *True or False*

16. According to the ASR curve, at the "full employment" range of output the unemployment rate is 0%.

17. According to classical theory, any shifts in the ADE curve will only lead to changes in inflation, and leave output unchanged.

18. There is a clear relationship between employment over the business cycle and well-being in industrialized countries: during downturns, mortality rates increase and during upswings, mortality rates decrease.

19. Stagflation is the combination of stagnation and deflation.

20. An oil price shock (assuming all else remains the same) can lead to stagflation.

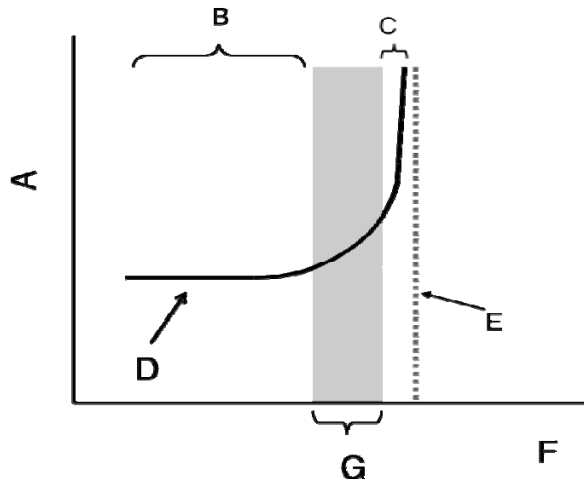
#### *Short Answer*

21. Why is the ADE curve downward sloping?

22. What variables would cause a shift in the ADE curve?
23. What are the four regions of the aggregate supply response curve diagram?
24. Why is the ASR curve gently rising in the full employment range?
25. Why is the ASR curve flat, rather than upward sloping, in the recession range?
26. Why is there no immediate response in the ASR curve to an increase in inflation?
27. What factors would cause a shift in the ASR curve (and in some cases, the maximum output)?
28. What is the classical school's rationale for the slope of the ASR curve?
29. One of the simplifying assumptions in the macroeconomic ADE/ASR model is that only the level of spending is important, not its composition. What does the "composition of spending" entail?
30. (In appendix) Is the difference between the classicals and Keynesians only a matter of time (i.e. the time of the adjustment to the long run full employment equilibrium), or is there a more fundamental difference in world view between the two approaches?

## Problems

1. Fill in the missing labels on the graph below:



- A: \_\_\_\_\_
- B: \_\_\_\_\_
- C: \_\_\_\_\_
- D: \_\_\_\_\_
- E: \_\_\_\_\_
- F: \_\_\_\_\_
- G: \_\_\_\_\_

2. For each of the following, illustrate the shift of one of the curves in the ASR/ADE model.

a. Business confidence rises as firms expect an increase in GDP, sales, and profits.

b. A rise in inflation increases people's expectations of inflation in the medium run.

c. Depletion of the Ogallala aquifer produces a long-lasting drought and reduces crop yields in the Midwest.

d. The distribution of high speed internet to rural areas boosts productivity.

3. Illustrate the following periods of history with the ASR/ADE model.

a. Government spending for the Vietnam war during 1964-69 pushed up the rate of inflation from about 1% to 5%.

b. In 1973-74, OPEC engaged in an oil embargo, causing an increase in oil prices. Inflation rises to above 9% in 1975, and the unemployment rate rises above 8%. (Illustrate the immediate effect.)

c. After another oil price shock in 1979, Volker conducted a contractionary monetary policy (choosing a lower target inflation rate). Inflationary expectations fell. The unemployment rate rises to almost 10%, but inflation is brought down from 9% to 4%. (Illustrate both the immediate and medium-run effects.)

d. The 1990s brought an era of innovation, increasing global competition, and weakened unions from years of anti-union government policies. By 1998, the unemployment rate was 4.5% and inflation was about 1%.

## Self Test

1. According to our textbook authors, why is the ADE curve downward sloping?
  - a. Because with higher inflation, consumers real income and wealth is less and they consume less, resulting in lower output.
  - b. Because with higher inflation, nominal interest rates will be higher, so businesses will engage in less investment spending, resulting in lower output.
  - c. Because with higher inflation, exports will be more expensive, resulting in less net exports and lower output.
  - d. Because as inflation increases, the Fed will cut interest rates and slow down the economy, resulting in lower output.
  - e. None of the above.
  
2. Which of the following would *not* cause a shift in the aggregate demand equilibrium (ADE) curve?
  - a. The government cuts taxes.
  - b. Expectations of a growing economy lifts business confidence.
  - c. The Fed chooses a lower inflation target.
  - d. The Fed sees falling inflation and responds with an interest rate cut.
  - e. A fall in the value of the U.S. dollar boosts exports.
  
3. Which of the following is *not* one of the four regions of the aggregate supply response curve diagram?
  - a. Maximum capacity output
  - b. Wage-price spiral
  - c. Full employment range of output
  - d. Recession
  - e. Depression
  
4. What is the shape of the ASR curve in the full employment range?
  - a. Flat and horizontal
  - b. Gently rising upwards
  - c. Steeply rising upwards
  - d. Completely vertical
  - e. Downward sloping

5. Which of the following would *not* cause a shift in the ASR curve?
- A natural occurrence, such as a bumper crop in agriculture.
  - An increase in labor productivity.
  - An increase in a key input of production, such as oil prices.
  - A change in investment spending.
  - A change in inflation that changes people's expectations of inflation in the medium run.
6. Which of the following would *not* cause a shift in both the ASR curve *and* maximum capacity output?
- A natural occurrence, such as a bumper crop in agriculture.
  - An increase in labor productivity.
  - An increase in the price of a key input of production, such as oil.
  - A change in inflation that changes people's expectations of inflation in the medium run.
  - None of the above.
7. Which of the following would cause the ADE curve to shift to the right?
- The government raises income taxes.
  - Firms become pessimistic about the future growth of GDP, sales, and profits.
  - The Fed shifts to a higher target rate of inflation.
  - Workers build expectations of higher inflation into their contracts.
  - None of the above.
8. What would have caused both the ASR curve and maximum capacity to shift to the right?
- A decrease in labor productivity.
  - A decrease in inflationary expectations.
  - A cut in income taxes.
  - The distribution of high-speed internet access to rural areas in the U.S.
  - None of the above.
9. Suppose a war destroys much of a nation's infrastructure. Assume everything else remains unchanged. How would the impact be illustrated with the ADE/ASR model?
- ADE shifts right/up.
  - ADE shifts left/down.
  - ASR and maximum capacity shift right/down.
  - ASR and maximum capacity shift left/up.
  - ADE, ASR and maximum capacity remain unchanged.

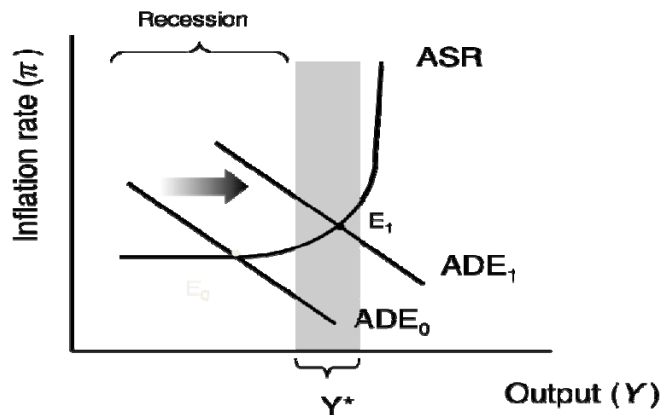
10. Suppose the U.S. Congress passes a stimulus package with tax rebates for all qualifying U.S. households. Assume everything else remains unchanged. How would the impact be illustrated with the ADE/ASR model?

- ADE shifts right/up.
- ADE shifts left/down.
- ASR and maximum capacity shift right/down.
- ASR and maximum capacity shift left/up.
- ADE, ASR and maximum capacity remain unchanged.

11. Suppose we observe an increase in inflation and a decrease in output. Which of the following could be the cause?

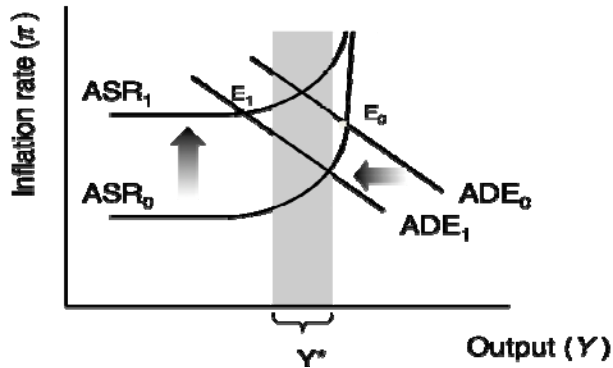
- The Fed has chosen a lower inflation target.
- Good weather has produced a bumper harvest.
- An increase in consumer confidence has boosted consumption spending
- The price of a key input, oil, has increased.
- None of the above.

12. In the figure below, which of the following events could explain the shift of the ADE curve to the right?



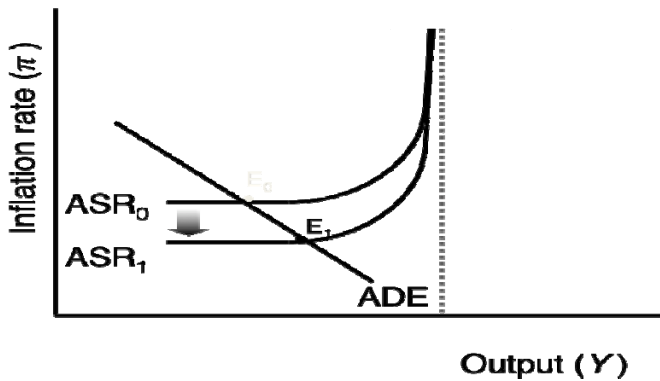
- The tax cuts of 1964.
- The tax increases of 1968, and the rise in inflationary expectations in 1968-71.
- The immediate effect of the oil price shocks of 1973-74.
- The medium run adjustment to the oil price shocks, with a fall in inflationary expectations in 1975-76.
- None of the above.

13. In the figure below, which of the following events could explain the shift of the ADE curve to the left, and the shift up of the ASR curve?



- The tax cuts of 1964.
- The tax increases of 1968, and the rise in inflationary expectations in 1968-71.
- The immediate effect of the oil price shocks of 1973-74.
- The medium run adjustment to the oil price shocks, with a fall in inflationary expectations in 1975-75.
- None of the above.

14. In the figure below, which of the following could explain the shift downwards of the ASR curve?



- The tax increases of 1968, and the rise in inflationary expectations in 1968-71.
- The immediate effect of the oil price shocks of 1973-74.
- The medium run adjustment to the oil price shocks, with a fall in inflationary expectations in 1975-75.
- The increase in productivity and globalization in the 1990s.
- None of the above.

15. If the Fed tries to lower the rate of inflation by choosing a lower inflation target, what are the effects in the immediate and medium run?

- a. ADE shifts down/left.
- b. ADE shifts down/left and ASR shifts down.
- c. ADE shifts up/right.
- d. ADE shifts up/right and ASR shifts up.
- e. ADE shifts down/left and ASR shifts up.

16. According to classical theory, the aggregate supply response (ASR) curve is:

- a. perfectly horizontal
- b. gently upward sloping
- c. flat at first, and then rises steeply
- d. perfectly vertical
- e. downward sloping

17. Which of the following statements does *not* characterize classical theory?

- a. Markets are self-adjusting, and the economy tends to function smoothly.
- b. Individuals are rational, optimizing agents, who quickly respond to market conditions.
- c. Output always remains at its full employment level.
- d. Any increases in aggregate demand will only lead to higher inflation.
- e. The government should intervene to keep market conditions favorable for corporations to maximize profits.

18. Which of the following statements characterizes Keynesian theory?

- a. Individuals are not always rational, optimizing agents, but instead are subject to waves of optimism or pessimism.
- b. The “animal spirits” of investors can lead to big fluctuations in the business cycle.
- c. The ADE curve is perpetually on the move over the peaks and troughs of the business cycle.
- d. Governments should intervene to smooth out the peaks and troughs of the business cycle and keep the ADE curve more stable.
- e. All of the above.

19. What simplifying assumptions were made in developing the macroeconomic ASR/ADE model?
- More employment (and less unemployment) is always a good thing.
  - Inflation must be kept as low as possible.
  - What matters is keeping the levels of aggregate spending high, not its composition.
  - A and B.
  - A and C.
20. Which of the following fiscal and monetary policies would enhance the goal of environmental sustainability?
- Carbon taxes on fossil fuels.
  - Government spending on renewable energy development.
  - Tax credits for environment-enhancing private investment spending.
  - Subsidized interest rates for environment-enhancing private investment spending.
  - All of the above.

### Answers to Active Review Questions

- Aggregate demand equilibrium
- Fed Reaction rule
- aggregate response curve
- maximum capacity
- wage-price spiral
- wage and price controls
- supply shock
- stagflation
- inflationary expectations
- composition (of spending)
- (In Appendix) real business cycle theory
- (In Appendix) rational expectations school
- (In Appendix) classical-Keynesian synthesis
- (In Appendix) New Keynesian macroeconomics
- (In Appendix) Post Keynesian macroeconomics
- False. There will be some unemployment (transitory unemployment) at the full employment range of output, but not enough unemployment to be considered a problem.
- True.
- False. In industrialized countries, mortality rates tend to *fall* when the economy slows down and *rise* during economic upswings.
- False. It is the combination of stagnation and inflation.
- True.
- The ADE curve is downward sloping due to the Fed reaction rule: when inflation is rising, the Fed will raise interest rates, thereby lowering output, and vice versa when

inflation is falling. Thus higher rates of inflation lead to lower rates of output, and vice versa.

22. The ADE curve would shift with changes in: levels of government spending, taxation, autonomous consumption, autonomous investment, and net exports, and with a change in the Fed inflation rate target.

23. The four regions are: maximum capacity output, the wage price spiral, the full employment range of output, and recession.

24. Because producers start to encounter bottlenecks in the supply of some of resources as they increase production, prices will rise in some sectors, leading to some aggregate increase in inflation.

25. The ASR curve is flat in the recession range because the existence of unemployed resources produces no pressure for inflation to rise, and the stickiness of wages and prices (their tendency to be slow in adjusting downwards) produces little pressure for inflation to fall.

26. There is no immediate response to inflation in the short run, because it takes time for people to notice the higher inflation and to incorporate it into their contracts.

27. Shifts in the ASR curve are caused by: changes in inflationary expectations, and supply shocks (whether beneficial or harmful) such as changes in the price of a key input, or changes in productivity.

28. The classical's ASR curve is perfectly vertical because the economy is always at its full employment equilibrium. If output falls below full employment equilibrium, unemployed workers would bid down wages, and the economy would thereby return to full employment. Likewise, if output were to rise above full employment equilibrium, workers would bid up wages, and the economy would again return to full employment.

29. The composition of spending entails both the types of goods and services produced, as well as the production methods used in generating GDP.

30. Some economists operating with a classical/Keynesian synthesis would see the differences merely as a matter of time. The New Keynesians would be among them, who would argue that it could take a significant amount of time to reach the long run full employment equilibrium. Post Keynesians, on the other hand, would see a much more fundamental difference between the two approaches. Their starting point is not the rational, optimizing behavior of individuals and markets that are smoothly functioning. Rather, they see the economy as unstable and unpredictable, with individuals influenced by waves of optimism or pessimism.

### **Answers to Problems**

1.

A: Inflation rate

B: Recession

C: Wage-Price Spiral

D: Aggregate Supply Response

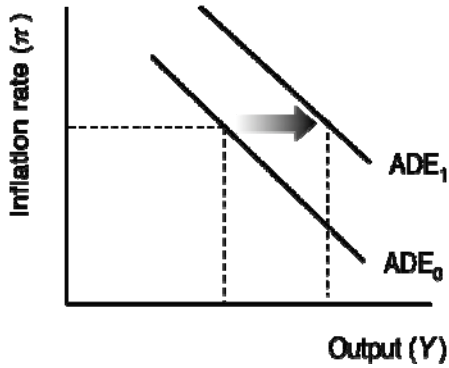
E: Maximum Capacity

F: Output (Y)

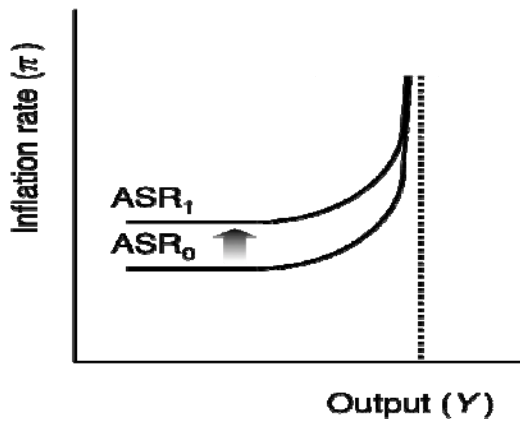
G:  $Y^*$  (Full employment output range)

2.

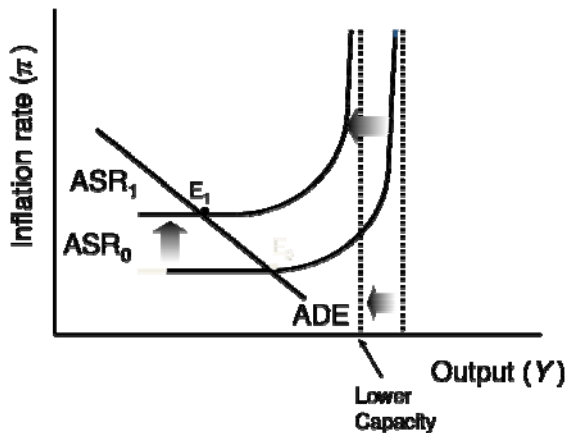
a. Business confidence rises as firms expect an increase in GDP, sales, and profits.



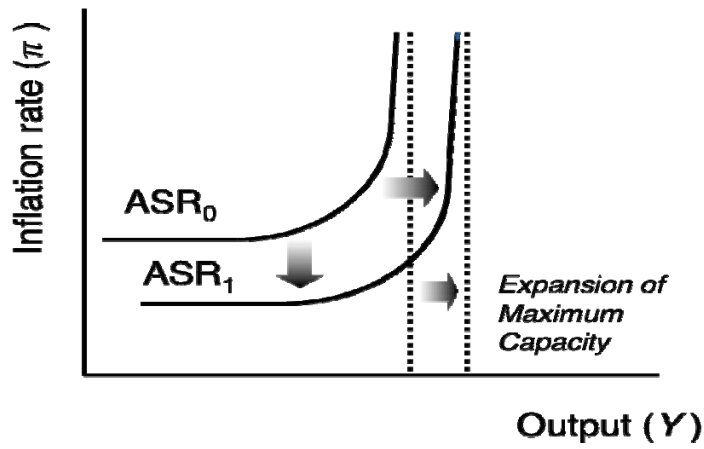
2b. A rise in inflation increases people's expectations of inflation in the medium run.



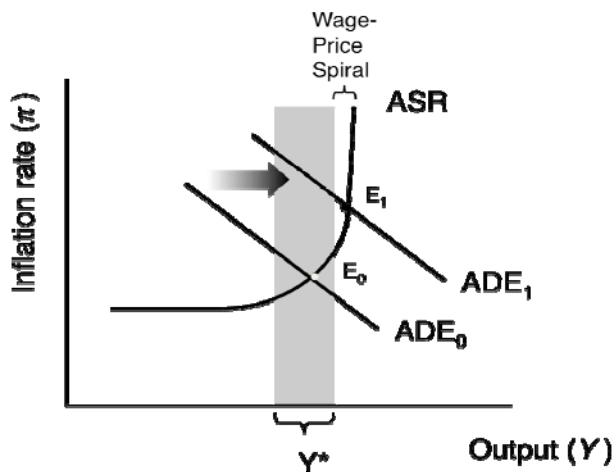
2c. Depletion of the Ogallala aquifer produces a long-lasting drought and reduces crop yields in the Midwest.



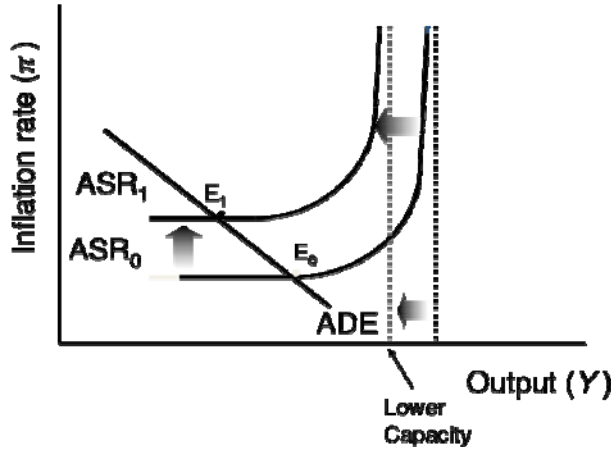
2d. The distribution of high speed internet to rural areas boosts productivity.



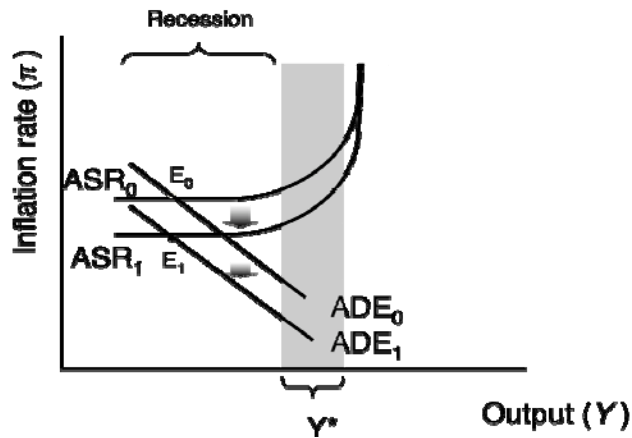
3a. Government spending for the Vietnam war during 1964-69 pushed up the rate of inflation from about 1% to 5%.



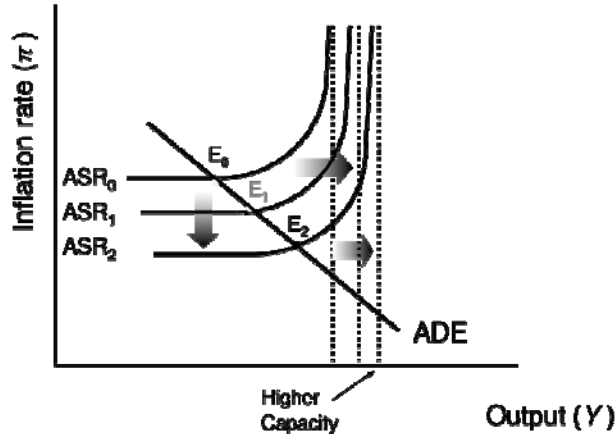
3b. In 1973-74, OPEC engaged in an oil embargo, causing an increase in oil prices. Inflation rises to above 9% in 1975, and the unemployment rate rises above 8%. (Illustrate the immediate effect.)



c. After another oil price shock in 1979, Volker conducted a contractionary monetary policy (choosing a lower target inflation rate). Inflationary expectations fell. The unemployment rate rises to almost 10%, but inflation is brought down from 9% to 4%. (Illustrate both the immediate and medium-run effects.)



d. The 1990s brought an era of innovation, increasing global competition, and weakened unions from years of anti-union government policies. By 1998, the unemployment rate was 4.5% and inflation was about 1%.



#### Answers to Self Test Questions

- |       |       |
|-------|-------|
| 1. D  | 11. D |
| 2. D  | 12. A |
| 3. E  | 13. B |
| 4. B  | 14. C |
| 5. D  | 15. B |
| 6. D  | 16. D |
| 7. C  | 17. E |
| 8. D  | 18. E |
| 9. D  | 19. E |
| 10. A | 20. E |