

THE AGGREGATE DEMAND (AD) CURVE p. 237

12. The *aggregate demand (AD) curve* graphs the negative relationship between aggregate output (income) and the price level. Each point on the *AD curve* is a point at which both the goods market and the money market are in equilibrium for a given value of the price level. The *AD curve* is *not* the sum of all the market demand curves in the economy.
13. An increase in the quantity of money supplied, an increase in government purchases, or a decrease in net taxes at a given price level shifts the aggregate demand curve to the right. A decrease in the quantity of money supplied, a decrease in government purchases, or an increase in net taxes shifts the aggregate demand curve to the left.

REVIEW TERMS AND CONCEPTS

aggregate demand (*AD*) curve, *p.* 237contractionary fiscal policy, *p.* 235contractionary monetary policy, *p.* 236crowding-out effect, *p.* 233expansionary fiscal policy, *p.* 233expansionary monetary policy, *p.* 233goods market, *p.* 229interest sensitivity *or* insensitivity of plannedinvestment, *p.* 234money market, *p.* 230policy mix, *p.* 236real wealth, *or* real balance, effect, *p.* 239

PROBLEMS

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- On June 5, 2003, the European Central Bank acted to decrease the short-term interest rate in Europe by half a percentage point, to 2 percent. The bank's president at the time, Willem Duisenberg, suggested that, in the future, the bank could reduce rates further. The rate cut was made because European countries were growing very slowly or were in recession. What effect did the bank hope the action would have on the economy? Be specific. What was the hoped-for result on C , I , and Y ?
- [Related to the *Economics in Practice* on *p.* 231]** In response to concerns of both the Treasury Department and the Congressional Oversight Panel regarding the value of loans being made to small businesses, the four largest U.S. banks (Bank of America, Citigroup, JP Morgan Chase, and Wells Fargo) all agreed to increase their small business lending practices in 2010. Search the Internet and describe any changes that have occurred in lending to small businesses since 2010. The text states that it is unclear whether the reduced lending is due more to a lack of lenders or a lack of borrowers. Go to www.sba.gov/advo/research and click on "Small Business Indicators." Select the most recent quarter from the quarterly indicator menu and describe what happened to demand for commercial and industrial loans as well as the level of optimism for small businesses. What correlation do you see between the changes in lending, the demand for loans, and the level of optimism for small businesses?
- During the third quarter of 1997, Japanese GDP was falling at an annual rate of over 11 percent. Many blamed the big increase in Japan's taxes in the spring of 1997, which was designed to balance the budget. Explain how an increase in taxes with the economy growing slowly could precipitate a recession. Do not skip steps in your answer. If you were head of the Japanese central bank, how would you respond? What impact would your policy have on the level of investment?
- Some economists argue that the "animal spirits" of investors are so important in determining the level of investment in the economy that interest rates do not matter at all. Suppose that this were true—that investment in no way depends on interest rates.
 - How would Figure 12.1 be different?
 - What would happen to the level of planned aggregate expenditures if the interest rate changed?
 - What would be different about the relative effectiveness of monetary and fiscal policy?
- For each of the following scenarios, tell a story and predict the effects on the equilibrium levels of aggregate output (Y) and the interest rate (r):
 - During 2005, the Federal Reserve was tightening monetary policy in an attempt to slow the economy. Congress passed a substantial cut in the individual income tax at the same time.
 - During the summer of 2003, Congress passed and President George W. Bush signed the third tax cut in 3 years. Many of the tax cuts took effect in 2005. Assume that the Fed holds M^s fixed.
 - In 1993, the government raised taxes. At the same time, the Fed was pursuing an expansionary monetary policy.
 - In 2005, conditions in Iraq led to a sharp drop in consumer confidence and a drop in consumption. Assume that the Fed holds the money supply constant.
 - The Fed attempts to increase the money supply to stimulate the economy, but plants are operating at 65 percent of their capacities and businesses are pessimistic about the future.
- Occasionally, the Federal Open Market Committee (FOMC) sets a policy designed to "track" the interest rate. This means that the FOMC is pursuing policies designed to keep the interest rate constant. If, in fact, the Fed were acting to counter any increases or decreases in the interest rate to keep it constant, what specific actions would you expect to see the Fed take if the following were to occur? (In answering, indicate the effects of each set of events on Y , C , S , I , M^s , M^d , and r .)
 - An unexpected increase in investor confidence leads to a sharp increase in orders for new plants and equipment.
 - A major New York bank fails, causing a number of worried people (not trusting even the FDIC) to withdraw a substantial amount of cash from other banks and put it in their cookie jars.

7. Paranoia, the largest country in central Antarctica, receives word of an imminent penguin attack. The news causes expectations about the future to be shaken. As a consequence, there is a sharp decline in investment spending plans.
- Explain in detail the effects of such an event on the economy of Paranoia assuming no response on the part of the central bank or the Treasury. (M^s , T , and G all remain constant.) Make sure you discuss the adjustments in the goods market and the money market.
 - To counter the fall in investment, the king of Paranoia calls for a proposal to increase government spending. To finance the program, the chancellor of the exchequer has proposed three alternative options:
 - Finance the expenditures with an equal increase in taxes
 - Keep tax revenues constant and borrow the money from the public by issuing new government bonds
 - Keep taxes constant and finance the expenditures by printing new money
- Consider the three financing options and rank them from most expansionary to least expansionary. Explain your ranking.
8. Why might investment not respond positively to low interest rates during a recession? Why might investment not respond negatively to high interest rates during a boom?
9. The aggregate demand curve slopes downward because when the price level is lower, people can afford to buy more and aggregate demand rises. When prices rise, people can afford to buy less and aggregate demand falls. Is this a good explanation of the shape of the AD curve? Why or why not?
10. By late summer 2010, the target fed funds rate was between zero and 0.25 percent. At the same time, “animal spirits” were dormant and there was excess capacity in most industries. That is, businesses were in no mood to build new plant and equipment if they were not using their already existing capital. Interest rates were at or near zero, and yet investment demand remained quite low. The unemployment rate was 9.6 percent in August 2010. These conditions suggest that monetary policy is likely to be a more effective tool to promote expansion than fiscal policy. Do you agree or disagree? Explain your answer.
11. Describe the policy mix that would result in each of the following situations.
 - The interest rate decreases, investment increases, and the change in aggregate output is indeterminate.
 - Aggregate output increases, and the interest rate change is indeterminate.
 - The interest rate increases, investment decreases, and the change in aggregate output is indeterminate.
 - Aggregate output decreases, and the interest rate change is indeterminate.
12. In the first few chapters of this book, we introduced the notion of supply and demand. One of the first things we did was to derive the relationship between the price of a product and the quantity demanded per time period by an individual household. Now we have derived what is called the **aggregate demand curve**. The two look the same and both seem to have a negative slope, but the logic is completely different. Tell one story that explains the negative slope of a simple demand curve and another story that explains the more complex aggregate demand curve (AD).
13. Expansionary policies are designed to stimulate the economy by increasing aggregate output. Explain why expansionary fiscal policy and expansionary monetary policy have opposite effects on the interest rate despite having the same goal of increasing aggregate output. Illustrate your answer with graphs of the money market.
14. Explain the effect, if any, that each of the following occurrences should have on the aggregate demand curve.
 - The Fed lowers the discount rate.
 - The price level decreases.
 - The federal government increases federal income tax rates in an effort to reduce the federal deficit.
 - Pessimistic firms decrease investment spending.
 - The inflation rate falls by 3 percent.
 - The federal government increases purchases to stimulate the economy.

CHAPTER 12 APPENDIX

The IS - LM Model

There is a useful way of depicting graphically the determination of aggregate output (income) and the interest rate in the goods and money markets. Two curves are involved in this diagram, the IS curve and the LM curve. In this Appendix, we will derive these two curves and use them to see how changes in government purchases (G) and the money supply (M^s) affect the equilibrium values of aggregate output (income) and the interest rate. The effects we describe here are the same as the effects we described in the main text; here we illustrate the effects graphically.

The IS Curve

We know that in the goods market there is an equilibrium level of aggregate output (income) (Y) for each value of the interest rate (r). For a given value of r , we can determine the

equilibrium value of Y . The equilibrium value of Y falls when r rises and rises when r falls. There is thus a *negative* relationship between the equilibrium value of Y and r . The reason for this negative relationship is the negative relationship between planned investment and the interest rate. When the interest rate rises, planned investment (I) falls, and this decrease in I leads to a decrease in the equilibrium value of Y . The negative relationship between the equilibrium value of Y and r is shown in Figure 12A.1. This curve is called the **IS curve**.¹ Each point on the IS curve represents the equilibrium point in the goods market for the given interest rate.

¹ The letter I stands for investment, and the letter S stands for saving. IS refers to the fact that in equilibrium in the goods market, planned investment equals saving.

fairly flat and that at high levels of aggregate output, the AS curve is vertical or nearly vertical. Thus, the AS curve slopes upward and becomes vertical when the economy reaches its capacity, or maximum, output.

3. Anything that affects an individual firm's marginal cost curve can shift the AS curve. The two main factors are wage rates and energy prices.

THE EQUILIBRIUM PRICE LEVEL *p. 250*

4. The *equilibrium price level* in the economy occurs at the point at which the AS and AD curves intersect. The intersection of the AS and AD curves corresponds to equilibrium in the goods and money markets *and* to a set of price/output decisions on the part of all the firms in the economy.

THE LONG-RUN AGGREGATE SUPPLY CURVE *p. 251*

5. If wages fully adjust to prices in the long run, then the long-run AS curve will be vertical.
6. The level of aggregate output that can be sustained in the long run without inflation is called *potential output* or *potential GDP*.

MONETARY AND FISCAL POLICY EFFECTS *p. 253*

7. If the economy is initially producing on the flat portion of the AS curve, an expansionary policy—which shifts the AD curve to the right—will result in a small increase in the equilibrium price level relative to the increase in equilibrium output. If the economy is initially producing on the steep portion of the AS curve, an expansionary policy results in a small increase in equilibrium output and a large increase in the equilibrium price level.
8. If the AS curve is vertical in the long run, neither monetary nor fiscal policy has any effect on aggregate output in the long run. For this reason, the exact length of the long run is one of the most pressing questions in macroeconomics.

CAUSES OF INFLATION *p. 255*

9. *Demand-pull inflation* is inflation initiated by an increase in aggregate demand. *Cost-push*, or *supply-side*, *inflation* is inflation initiated by an increase in costs like energy prices. An increase in costs may also lead to *stagflation*—the situation in which the economy is experiencing a contraction and inflation simultaneously.
10. Inflation can become “built into the system” as a result of expectations. If prices have been rising and people form their expectations on the basis of past pricing behavior, firms may continue raising prices even if demand is slowing or contracting.
11. When the price level increases, so too does the demand for money. If the economy is operating on the steep part of the AS curve and the Fed tries to keep the interest rate constant by increasing the supply of money, the result could be a *hyperinflation*—a period of very rapid increases in the price level.

THE BEHAVIOR OF THE FED *p. 259*

12. In practice, the Fed controls the interest rate rather than the money supply. The interest rate value that the Fed chooses depends on the state of the economy. The Fed wants high output and low inflation. The Fed is likely to decrease the interest rate during times of low output and low inflation, and it is likely to increase the interest rate during times of high output and high inflation.
13. The Fed generally had high interest rates in the 1970s and early 1980s as it fought inflation. Since 1983, inflation has been low by historical standards and the Fed focused in this period on trying to smooth fluctuations in output.
14. Inflation targeting is the case where the monetary authority weights only inflation. It chooses its interest rate values with the aim of keeping the inflation rate within some specified band over some specified horizon.

REVIEW TERMS AND CONCEPTS

aggregate supply, *p. 248*

aggregate supply (AS) curve, *p. 248*

cost-push, or supply-side, inflation, *p. 256*

cost shock, or supply shock, *p. 250*

demand-pull inflation, *p. 255*

equilibrium price level, *p. 250*

inflation targeting, *p. 264*

potential output, or potential GDP, *p. 253*

stagflation, *p. 256*

PROBLEMS

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1. In Japan during the first half of 2000, the Bank of Japan kept interest rates at a near zero level in an attempt to stimulate demand. In addition, the government passed a substantial increase in government expenditure and cut taxes. Slowly, Japanese GDP began to grow with absolutely no sign of an increase in the price level. Illustrate the position of the Japanese economy with aggregate supply and demand curves. Where on the short-run AS curve was Japan in 2000?
2. In 2008, the price of oil rose sharply on world markets. What impact would you expect there to be on the aggregate price level and on real GDP? Illustrate your answer with aggregate demand and supply curves. What would you expect to be the effect on interest rates if the Fed held the money supply constant? Tell a complete story.
3. By using aggregate supply and demand curves to illustrate your points, discuss the impacts of the following events on the price level and on equilibrium GDP (Y) in the *short run*:
 - a. A tax cut holding government purchases constant with the economy operating at near full capacity
 - b. An increase in the money supply during a period of high unemployment and excess industrial capacity

- c. An increase in the price of oil caused by a war in the Middle East, assuming that the Fed attempts to keep interest rates constant by accommodating inflation
 - d. An increase in taxes and a cut in government spending supported by a cooperative Fed acting to keep output from falling
4. During 1999 and 2000, a debate raged over whether the United States was at or above potential GDP. Some economists feared the economy was operating at a level of output above potential GDP and inflationary pressures were building. They urged the Fed to tighten monetary policy and increase interest rates to slow the economy. Others argued that a worldwide glut of cheap products was causing input prices to be lower, keeping prices from rising.

By using aggregate supply and demand curves and other useful graphs, illustrate the following:

- a. Those pushing the Fed to act were right, and prices start to rise more rapidly in 2000. The Fed acts belatedly to slow money growth (contract the money supply), driving up interest rates and pushing the economy back to potential GDP.
 - b. The worldwide glut gets worse, and the result is a falling price level (deflation) in the United States despite expanding aggregate demand.
5. [Related to the Economics in Practice on p. 252] The *Economics in Practice* describes the simple Keynesian aggregate supply curve as one in which there is a maximum level of output given the constraints of a fixed capital stock and a fixed supply of labor. The presumption is that increases in demand when firms are operating below capacity will result in output increases and no input price or output price changes but that at levels of output above full capacity, firms have no choice but to raise prices of demand increases. In reality, however, the short-run aggregate supply curve isn't flat and then vertical. Rather, it becomes steeper as we move from left to right on the diagram. Explain why. What circumstances might lead to an equilibrium at a very flat portion of the AS curve? at a very steep portion?
6. Using aggregate supply and aggregate demand curves to illustrate, describe the effects of the following events on the price level and on equilibrium GDP in the *long run* assuming that input prices fully adjust to output prices after some lag:
- a. An increase occurs in the money supply above potential GDP
 - b. A decrease in government spending and in the money supply with GDP above potential GDP occurs
 - c. Starting with the economy at potential GDP, a war in the Middle East pushes up energy prices temporarily. The Fed expands the money supply to accommodate the inflation.
7. Two separate capacity constraints are discussed in this chapter: (1) the actual physical capacity of existing plants and equipment, shown as the vertical portion of the short-run AS curve, and (2) potential GDP, leading to a vertical long-run AS curve. Explain the difference between the two. Which is greater, full-capacity GDP or potential GDP? Why?
8. In country A, all wage contracts are indexed to inflation. That is, each month wages are adjusted to reflect increases in the cost of living as reflected in changes in the price level. In country B, there are no cost-of-living adjustments to wages, but the workforce is completely unionized. Unions negotiate 3-year contracts. In which country is an expansionary monetary policy likely to have a larger effect on aggregate output? Explain your answer using aggregate supply and aggregate demand curves.
9. During 2001, the U.S. economy slipped into a recession. For the next several years, the Fed and Congress used monetary and fiscal policies in an attempt to stimulate the economy. Obtain data on

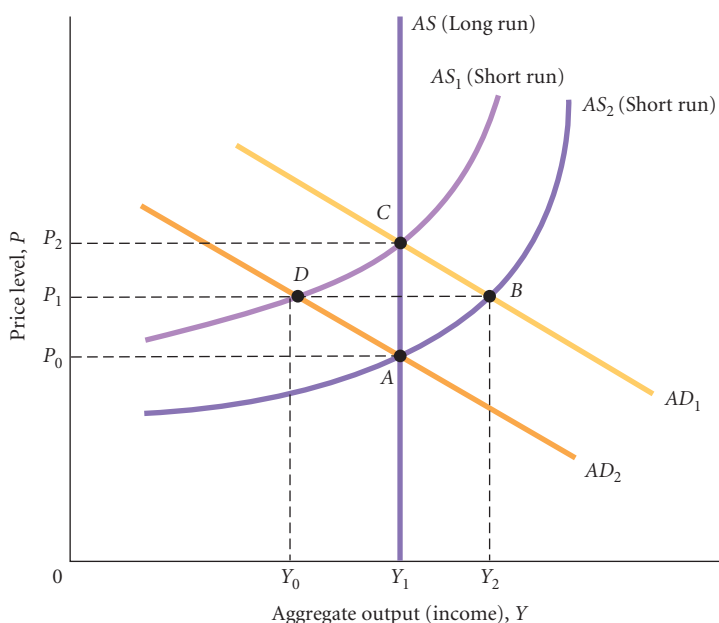
interest rates (such as the prime rate or the federal funds rate). Do you see evidence of the Fed's action? When did the Fed begin its expansionary policy? Obtain data on total federal expenditures, tax receipts, and the deficit. (Try www.commerce.gov). When did fiscal policy become "expansionary"? Which policy seems to have suffered more from policy lags?

10. Describe the Fed's tendency to "lean against the wind." Do the Fed's policies tend to stabilize or destabilize the economy?
11. [Related to the Economics in Practice on p. 261] In August 2010, the Fed's discount rate was 0.75 percent and the federal funds rate was 0.25 percent, with a Fed target of 0–0.25 percent. The *Economics in Practice* states that all of the major investment banks employ economists to help them forecast what the Fed will do, and in mid-2010, many of these economists pushed back their expectations of when the Fed would raise interest rates, citing lower-than-anticipated inflation expectations, slow job growth, and an overall weak economy as reasons for the delay in rate increases. Go to www.frb.gov, www.bea.gov, and www.bls.gov to see what has happened to interest rates, the inflation rate, the unemployment rate, and GDP since August 2010. Were the economists' forecasts of the Fed delaying interest rate increases until 2011 correct? Describe any apparent correlation between the changes in interest rates and changes in the inflation rate, the unemployment rate, and GDP since August 2010.
12. From the following graph, identify the initial equilibrium, the short-run equilibrium, and the long-run equilibrium based on the scenarios below. Explain your answers and identify what happens to the price level and aggregate output.

Scenario 1. The economy is initially in long-run equilibrium at point A, and a cost shock causes cost-push inflation. The government reacts by implementing an expansionary fiscal policy.

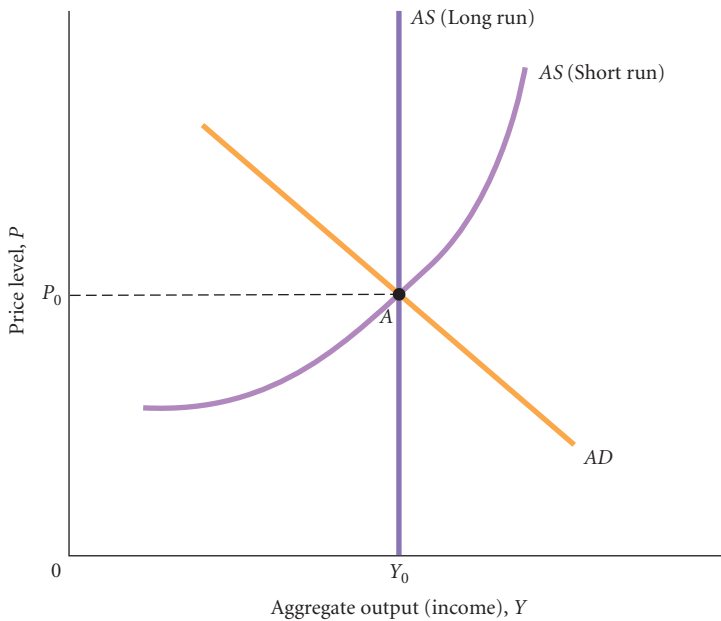
Scenario 2. The economy is initially in long-run equilibrium at point A, and an increase in government purchases causes demand-pull inflation. In the long run, wages respond to the inflation.

Scenario 3. The economy is initially in long-run equilibrium at point C, and the federal government implements an increase in corporate taxes and personal income taxes. In the long run, firms and workers adjust to the new price level and costs adjust accordingly.



Scenario 4. The economy is initially in equilibrium at point C, and energy prices decrease significantly. The government reacts by implementing a contractionary fiscal policy.

13. The economy of Mayberry is currently in equilibrium at point A on the graph below. Prince Barney of Mayberry has decided that he wants the economy to grow and has ordered the Royal Central Bank of Mayberry to print more currency so banks can expand their loans to stimulate growth. Explain what will most likely happen to the economy of Mayberry as a result of Prince Barney's actions and show the result on the graph.



14. Evaluate the following statement: In the short run, if an economy experiences inflation of 10 percent, the cause of the inflation is unimportant. Whatever the cause, the only important issue the government needs to be concerned with is the 10 percent increase in the price level.
15. [Related to the *Economics in Practice* on p. 258] A monthly survey conducted by Torcuato Di Tella University in Buenos Aires showed that in August 2010, people in Argentina expected inflation to increase 25 percent over the next 12 months, a similar response to the previous month's survey. This shows a large discrepancy between inflation expectations and the Argentine Central Bank's monthly index of consumer prices which showed prices rising at an annual rate of 11.2 percent, the highest level in 4 years. Use aggregate supply and demand curves to show the effect of these expectations of inflation on the Argentine economy, assuming firms increase prices in response to the expectations. What can the Argentine Central Bank do to try to lower the expectations to their projected inflation level of 11.2 percent? What impact would this have on the aggregate supply and demand curves?

Source: "Twelve months inflation expectations in Argentina steady at 25%," *MercoPress*, August 20, 2010.