

4. Treasury bills have a fixed face value (say, \$1,000) and pay interest by selling at a discount. For example, if a one-year bill with a \$1,000 face value sells today for \$950, it will pay $\$1,000 - \$950 = \$50$ in interest over its life. The interest rate on the bill is therefore $\$50/\$950 = 0.0526$, or 5.26 percent.
 - a. Suppose the price of the Treasury bill falls to \$925. What happens to the interest rate?
 - b. Suppose, instead, that the price rises to \$975. What is the interest rate now?
 - c. **(More difficult)** Now generalize this example. Let P be the price of the bill and r be the interest rate. Develop an algebraic formula expressing r in terms of P . (Hint: The interest earned is $\$1,000 - P$. What is the percentage interest rate?) Show that this formula illustrates the point made in the text: Higher bond prices mean lower interest rates.
5. Explain what a \$5 billion increase in bank reserves will do to real GDP under the following assumptions:
 - a. Each \$1 billion increase in bank reserves reduces the rate of interest by 0.5 percentage point.
 - b. Each 1 percentage point decline in interest rates stimulates \$30 billion worth of new investment.

- c. The expenditure multiplier is two.
- d. The aggregate supply curve is so flat that prices do not rise noticeably when demand increases.
6. Explain how your answers to Test Yourself Question 5 would differ if each of the assumptions changed. Specifically, what sorts of changes in the assumptions would weaken the effects of monetary policy?
7. Explain how your answers to Test Yourself Question 5 would differ if banks decided to hold onto the \$5 billion in new reserves as excess reserves.
8. **(More difficult)** Consider an economy in which government purchases, taxes, and net exports are all zero. The consumption function is

$$C = 300 + 0.75Y$$

and investment spending (I) depends on the rate of interest (r) in the following way:

$$I = 1,000 - 100r$$

Find the equilibrium GDP if the Fed makes the rate of interest (a) 2 percent ($r = 0.02$), (b) 5 percent, and (c) 10 percent.

Discussion Questions

1. Why does a modern industrial economy need a central bank?
2. What are some reasons behind the worldwide trend toward greater central bank independence? Are there arguments on the other side?
3. Explain why the quantity of bank reserves supplied normally is higher and the quantity of bank reserves demanded normally is lower at higher interest rates.
4. From September 2007 through December 2008, the Fed believed that interest rates needed to fall and took steps to reduce them, eventually cutting the federal funds rate from 5.25 percent to nearly zero. How did the Fed reduce the federal funds rate? Illustrate your answer on a diagram.
5. Once the federal funds rate reached (approximately) zero, which happened in December 2008, what options were still open to the Fed. What did it actually do? (Note: This may be a good question to discuss with your instructor.)
6. Explain why both business investments and purchases of new homes rise when interest rates decline.
7. From 2003 to 2011, the federal government's budget deficit rose sharply because of tax cuts and increased spending. If the Federal Reserve wanted to maintain the same level of aggregate demand in the face of large increases in the budget deficit, what should it have done? What would you expect to happen to interest rates?