that have agreed to accept it. The idea is to help local consumers save money and at the same time give local businesses a boost. These local currencies are being issued in communities as diverse as small towns in North Carolina and Massachusetts to cities as large as Detroit, Michigan. Do these local currencies qualify as money based on the description of what money is in the chapter?

1.6 Suppose on your 21st birthday, your eccentric grandmother invites you to her house, takes you into her library, removes a black velvet painting of Elvis Presley from the wall, opens a hidden safe where she removes 50 crisp $100 bills, and hands them to you as a present, claiming you are her favorite grandchild. After thanking your grandmother profusely (and helping her rehang the picture of Elvis), you proceed to your bank and deposit half of your gift in your checking account and half in your savings account. How will these transactions affect M1 and M2? How will these transactions change M1 and M2 in the short run? What about the long run?

25.2 HOW BANKS CREATE MONEY

LEARNING OBJECTIVE: Explain how banks create money.

2.1 For each of the following, determine whether it is an asset or a liability on the accounting books of a bank. Explain why in each case.
- Cash in the vault
- Demand deposits
- Savings deposits
- Reserves
- Loans
- Deposits at the Federal Reserve

2.2 The U.S. money supply (M1) at the beginning of June, 2018 was $3,676.7 billion broken down as follows: $1,580.4 billion in currency, $1.8 billion in traveler's checks, and $2,094.5 billion in checking deposits. Suppose the Fed decided to decrease the money supply by increasing the reserve requirement from 10 percent to 12 percent. Assuming all banks were initially loaned up (had no excess reserves) and currency held outside of banks did not change, how large a change in the money supply would have resulted from the change in the reserve requirement?

2.3 Do you agree or disagree with each of the following statements? Explain your answers.

a. When the Treasury of the United States issues bonds and sells them to the public to finance the deficit, the money supply remains unchanged because every dollar of money taken in by the Treasury goes right back into circulation through government spending. This is not true when the Fed sells bonds to the public.

b. The money multiplier depends on the marginal propensity to save.

*2.4 When the Fed adds new reserves to the system, some of these new reserves find their way out of the country into foreign banks or foreign investment funds. In addition, some portion of the new reserves ends up in people's pockets and under their mattresses instead of in bank vaults. These "leakages" reduce the money multiplier and sometimes make it difficult for the Fed to control the money supply precisely. Explain why this is true.

2.5 You are given this account for a bank:

Assets		Liabilities	
Reserves	$1,200	$8,000	Deposits
Loans	6,800		

The required reserve ratio is 10 percent.

a. How much is the bank required to hold as reserves given its deposits of $8,000?

b. How much are its excess reserves?

c. By how much can the bank increase its loans?

d. Suppose a depositor comes to the bank and withdraws $500 in cash. Show the bank's new balance sheet, assuming the bank obtains the cash by drawing down its reserves. Does the bank now hold excess reserves? Is it meeting the required reserve ratio? If not, what can it do?

2.6 Suppose Ginger deposits $12,000 in cash into her checking account at the Bank of Skidoo. The Bank of Skidoo has no excess reserves and is subject to a 4 percent required reserve ratio.

a. Show this transaction in a T-account for the Bank of Skidoo.

b. Assume the Bank of Skidoo makes the maximum loan possible from Ginger's deposit to Thurston and show this transaction in a new T-account.

c. Thurston decides to use the money he borrowed to purchase a sail boat. He writes a check for the entire loan amount to Gilligan's Seagoing Vessels, which deposits the check in its bank, the Paradise Bank of Kona, Hawaii. When the check clears, the Skidoo Bank transfers the funds to the Paradise Bank. Show these transactions in a new T-account for the Skidoo Bank and in a T-account for the Paradise Bank.

d. What is the maximum amount of deposits that can be created from Ginger's initial deposit?

e. What is the maximum amount of loans that can be created from Ginger's initial deposit?

2.7 **[Related to the *Economics in Practice* on p. 516]** In the digital age, customer preference for conducting business online versus patronizing a traditional brick-and-mortar location has grown rapidly in many industries, including banking. According to a recent report published by Allied Market Research, online banking is expected to reach a global market size of almost $30 million by 2026, up from $7.3 million only 10 years earlier. Briefly explain how the growth in online banking could affect the timing and severity of a bank run.

25.3 THE FEDERAL RESERVE SYSTEM

LEARNING OBJECTIVE: Define the functions and structure of the Federal Reserve System.

3.1 The United States is divided into 12 Federal Reserve districts, each with a District Bank. These Districts and the locations for the District Bank in each region are shown in Figure 25.4. Do some research to find out why the districts are divided as they are, why the District Banks are located

b. What is the effect of the Treasury sale on the money supply in Doppelganger?

c. Assuming no leakage of reserves out of the banking system, what is the effect of the central bank purchase of bonds on the money supply?

6.2 In 2000, the federal debt was being paid down because the federal budget was in surplus. Recall that surplus means that tax collections (T) exceed government spending (G). The surplus ($T - G$) was used to buy back government bonds from the public, reducing the federal debt. As we discussed in this chapter, the main method by which the Fed increases the money supply is to buy government bonds by using open market operations. What is the impact on the money supply of using the fiscal surplus to buy back bonds? In terms of their impacts on the money supply, what is the difference between Fed open market purchases of bonds and Treasury purchases of bonds using tax revenues?

6.3 If the head of the Central Bank of Brazil wanted to decrease the supply of money in Brazil in 2019, which of the following would do it? Explain your answer.
Increase the required reserve ratio
Decrease the required reserve ratio
Increase the discount rate
Decrease the discount rate
Buy government securities in the open market
Sell government securities in the open market

6.4 Suppose in the Republic of Sasquatch that the regulation of banking rested with the Sasquatchian Congress, including the determination of the reserve ratio. The Central Bank of Sasquatch is charged with regulating the money supply by using open market operations. In September 2018, the money supply was estimated to be 84 million yetis. At the same time, bank reserves were 12.6 million yetis and the reserve requirement was 15 percent. The banking industry, being "loaned up," lobbied the Congress to cut the reserve ratio. The Congress yielded and cut required reserves to 12 percent. What is the potential impact on the money supply? Suppose the central bank decided that the money supply should not be increased. What countermeasures could it take to prevent the Congress from expanding the money supply?

6.5 What are the three traditional tools the Fed can use to control the interest rate via changing the money supply? Briefly describe how the Fed can use each of these tools to either increase or decrease the money supply.

CRITICAL THINKING QUESTIONS

QUESTION 1 Money serves three common functions: a means of payment, a store of value, and a unit of account. How well do cryptocurrencies, such as Bitcoin, provide these functions?

QUESTION 2 In this chapter, you learned that the money multiplier is calculated as one divided by the required reserve ratio. This definition implicitly assumes that banks are not holding excess reserves. Would the existence of excess reserves lead the money multiplier to be smaller or larger?

CHAPTER 25 APPENDIX

LEARNING OBJECTIVE

Explain the relationship between a two-year interest rate and a one-year interest rate.

The Various Interest Rates in the U.S. Economy MyLab Economics Concept Check

Although there are many different interest rates in the economy, they tend to move up or down with one another. Here we discuss some of their differences. We first look at the relationship between interest rates on securities with different maturities, or terms. We then briefly discuss some of the main interest rates in the U.S. economy.

The Term Structure of Interest Rates MyLab Economics Concept Check

The term structure of interest rates is the relationship among the interest rates offered on securities of different maturities. The key here is understanding issues such as these: How are these different rates related? Does a two-year security (an IOU that promises to repay principal, plus interest, after two years) pay a lower annual rate than a one-year security (an IOU to be repaid, with interest, after one year)? What happens to the rate of interest offered on one-year securities if the rate of interest on two-year securities increases?

Assume that you want to invest some money for two years and at the end of the two years you want it back. Assume that you want to buy government securities. For this analysis, we restrict your choices to two: (1) You can buy a two-year security today and hold it for two years, at which time you cash it in (we will assume that the interest rate on the two-year security is 3 percent per year), or