Chapter Summary

This chapter begins by examining the role money plays in the economy and how economists define money. It then looks at the flow of money in and out of banks and saw how banks can create money with deposits and loans. Finally, it shows the structure of the Federal Reserve and the key roles that central banks play during financial crises. Here are the main points you should remember from this chapter:

- Money consists of anything we regularly used to make exchanges. In modern economies, money consists primarily of currency and deposits in checking accounts.
- Banks are financial intermediaries that earn profits by accepting deposits and making loans. Deposits, which are liabilities of banks, are included in the money supply.
- Banks are required by law to hold a fraction of their deposits as reserves, either in cash or in deposits with the Federal Reserve. Total reserves consist of required reserves plus excess reserves.
- If there is an increase in reserves in the banking system, the supply of money will expand by a multiple of the initial deposit. This multiple is known as the money multiplier.
- Decisions about the supply of money are made at the Federal Open Market Committee (FOMC), which includes the seven members on the Board of Governors and the president of the New York Federal Reserve Bank, as well as four of the other regional bank presidents, who serve on a rotating basis.
- In a financial crisis like those that occurred in 2001 and 2008, the Fed can help stabilize the economy. Current and recent Fed chairmen have been powerful figures in the national economy.

Learning Objectives

1. Identify the components of money in the U.S. economy.
2. Explain the process of multiple expansion and contraction of deposits.
3. Describe the structure of the Federal Reserve.
4. Discuss examples of how the Federal Reserve acts during financial crises.
13.1 What Is Money?

Economists define money as any items that are regularly used in economic transactions or exchanges and accepted by buyers and sellers. Let’s consider some examples of money used in that way. Clearly, currency is money because people can use it to purchase coffee, newspapers, candy, movie tickets, and other goods. Checks also function as money because people use them to pay suppliers, such as utility suppliers. In some ancient cultures, people used precious stones in exchange for goods such as food and clothing. In more recent times, gold bars have served as money. During World War II, prisoners of war did not have currency, but they did have rations of cigarettes, so they used them like money, trading them for what they wanted. Regardless of what the item is that is used for money, money has three basic properties, which we discuss next.

Money is given by buyers to sellers in economic exchanges; therefore, it serves as a medium of exchange. Without a medium of exchange, only barter would exist. The number of transactions would slow down dramatically. Barter, the exchange of one good or service for another, presents obvious problems. Barter requires a double coincidence of wants. A buyer and seller must have exactly what the other wants for an exchange to occur. Exchanges would be inhibited if double coincidence of wants were always required for trade. By serving as a medium of exchange, money solves this bartering problem. You can sell something for money, then hold on to the money until you find what you want to buy with the money. With money, there is no need for a double coincidence of wants. This is why money exists in all societies: It makes economic transactions much easier. Recall the voluntary exchange principle.

Voluntary Exchange Principle
A voluntary exchange between two people makes both people better off.

In summary, money allows individuals to make exchanges easily. Without money, exchanges would be inhibited. Most transactions that make both people better off would not be possible.

Another purpose of money is to serve as a unit of account. A unit of account is a standard unit in which prices can be stated and the value of goods and services can be compared. In our economy, money is used as the unit of account because prices are all quoted in terms of money. It is useful to have the medium of exchange also be the unit of account so that prices for all goods and services are quoted in terms of the medium of exchange that is used in transactions—in our case, money.

The last purpose of money is its role as a liquid store of value. A store of value is the property of money that it preserves value until it is used in an exchange. Many assets, such as stocks, bonds, or real estate, serve as a store of value. But money is a liquid store of value. It is easily exchanged in transactions but holds value over time. Money is actually a somewhat imperfect store of value because of inflation. As prices increase, while the nominal value of the money doesn’t change, the real value of money or purchasing power falls.

Money has evolved over time. In earlier centuries, money could take many forms: gold bars, silver, beads, knives, and tobacco. These are examples of commodity money systems in which an actual commodity (gold or silver) serves as money. At some point, governments began issuing paper money. However, the paper money was backed by an underlying commodity, for example, so many ounces of gold. Under a traditional gold standard, where gold backs up paper money, an individual could present paper money to the government and receive its stated value in gold. In other words, paper money could be exchanged for gold. Prior to 1933 in the United States, individuals could exchange their dollars for gold. Fiat money has no intrinsic value—it is simply created by a government decree. A government will issue paper money...
and make this money the official legal tender of the society. In the United States today, if you take a $100 bill to the government, you will not receive any gold or silver—just another $100 bill in return.

How is the amount of money in a country measured? In the United States, the Federal Reserve or the Fed measures the amount of money in the economy. These measures are called monetary aggregates. The most basic measure of money in the United States is called M1. It is the sum of currency in the hands of the public, demand deposits, other checkable deposits, and traveler’s checks. Figure 13.1 shows their relative percentages. Note that currency is the largest form of M1 balances. M1 does not include all the assets that are used to make economic exchanges. M2 includes all M1 plus deposits in savings accounts, deposits in money market mutual funds, and time deposits of less than $100,000. Figure 13.2 shows percentages of each category. Notice that savings deposits make up the largest part of M2 balances, even greater than M1.

**Caution!**

Credit cards are not money. Although used as a medium of exchange, credit cards are debt instruments. Debit cards serve as electronic checks but do not create an independent source of money. People who use debit cards are accessing funds in already existing checking account balances.

Let’s review an Application that answers a key question:

1. How do small Brazilian towns use currency to encourage local commerce?

**APPLICATION 1: MONEY WITH THE FACE OF RODENTS**

This Application describes the use of a local currency to encourage residents to shop in stores in their own town. The *capivari* can be used as a medium of exchange in the city of Silva Jardim and local merchants offer discounts for using this currency instead of the official Brazilian currency.

### 13.2 How Banks Create Money

In this section, we will learn the role that banks play in the creation of money in a modern economy. To understand this role, we first have to look more carefully at the behavior of banks and in particular their balance sheet.

A **balance sheet** is an account statement for a bank that shows the sources of its funds (liabilities) as well as the uses of its funds (assets). The purpose of looking at a balance sheet is to learn how the bank raises the money and where it goes after it has been raised. Balance sheets have two sides: one for assets and one for liabilities. **Liabilities** are the source of funds for the bank, including deposits and owners’ equity. If you open a checking account and deposit your funds in it, the bank is liable for returning the funds to you when you want them. The bank must also pay you interest on the account, if you keep enough money in it. Your deposits are therefore the bank’s liabilities. **Assets**, in contrast, are the uses of the funds of the bank, including loans and reserves, and generate income for the bank. Loans made by the bank are examples of its assets because borrowers must pay interest on the loans the bank collects. When a bank is initially opened, its owners must place their own funds into the bank so it has some startup funds. We call
these funds owners’ equity. If the bank subsequently makes a profit, owners’ equity increases; if it loses money, owners’ equity decreases.

In Figure 13.3, we show the assets and liabilities of a hypothetical bank. On the liability side, the bank has $2,000 of deposits and owners’ equity is $200. Owners’ equity is entered on the liability side of the balance sheet because it is a source of the bank’s funds. The total source of funds is therefore $2,200—the deposits in the bank plus owners’ equity.

On the asset side, the bank holds $200 in reserves, the portion of banks’ deposits set aside in either vault cash or as deposits at the Federal Reserve. These are assets that are not lent out. Banks normally do not earn any interest on these reserves. Hence, they try to keep as little excess reserves on hand as possible and loan out as much as they can. Banks are required by law to hold a specific fraction of their deposits as reserves, called required reserves. If a bank chooses to hold additional reserves beyond what is required, these are called excess reserves. A bank’s reserves are the sum of its required and excess reserves.

Caution!

To avoid confusion, keep in mind that reserves and required reserves are not the same thing. Reserves should be thought of as total reserves to the bank. The bank then has required reserves it must hold by law. The bank can use the remaining reserves or excess reserves for loans or to hold in cash for customers. However, banks can also borrow reserves from other banks. These borrowed reserves are counted as part of a bank’s total reserves.

Now that we understand the concept of reserves, excess reserves, and required reserves, let’s look at how money is created through the banking sector. Figure 13.4 shows how banks create money. Let’s walk through how this process works. A person deposits $1,000 in cash. The initial deposit is received by the bank. Some of the deposit is held as required reserves, and the remainder is excess reserves. The First Bank of Hollywood lends the excess reserves in hopes of gaining interest on the loan. Assuming the reserve ratio is 10 percent, then $100 is held in required reserves and the remaining $900 is loaned out. The Second Bank of Burbank then receives a deposit of the loaned $900. The Second Bank holds 10 percent in required reserves, or $90. The remaining $810 is loaned out. This process repeats itself until it becomes unprofitable.

The original $1,000 cash deposit has created checking account balances throughout Los Angeles. What’s the total amount? Adding up the new accounts in all the banks (even the ones we have not named), we have:

\[
$1,000 + $900 + $810 + $729 + 656.10 + \ldots = $10,000
\]

How did we come up with this sum? It’s from the following simple formula, which we derive in the appendix to this chapter:

Key Equation

\[
\text{total increase in checking accounts in all banks} = (\text{initial deposit}) \times \frac{1}{\text{reserve ratio}}
\]
Notice that we referred to “change,” meaning an increase or decrease. Here’s why: In our example, the public, represented by the person who initially made the $1,000 deposit at the First Bank of Hollywood, holds $1,000 less in currency. However, deposits increased by $10,000. Therefore, the money supply, M1, increased by $9,000 ($10,000 – $1,000).

The term \( \frac{1}{\text{reserve ratio}} \) in the formula is called the money multiplier. It tells us what the total increase in checking account deposits would be for any initial cash deposit. In the banking system, an initial cash deposit triggers additional rounds of deposits and lending by banks. This leads to a multiple expansion of deposits.

The first three banks in the figure loaned out all of their excess reserves and the borrowers deposited the full sum of their loans. In the real world, though, people hold part of their loans as cash and banks don’t necessarily loan out every last dime of their excess reserves. Consequently, a smaller amount of money will be created than what’s shown in Figure 13.4.

This model is simplified in that it is assumed that all deposits go into the banks. In reality, people hold part of their loans as cash. The cash that people hold is not available for the banking system to lend out. The more money people hold in cash, the lower the amount they have on deposit that can be loaned out again.

The money-creation process also works in reverse. Suppose you go to your bank and ask for $1,000 in cash from your checking account. The bank must pay you the $1,000. The bank’s liabilities fall by $1,000, but its assets must also fall by $1,000. Withdrawing your $1,000 means two things at the bank: First, if the reserve ratio is 0.1, the bank will reduce its reserves by $100. Second, your $1,000 withdrawal minus the $100 reduction in reserves means that the bank has $900 less to lend out. The bank will therefore reduce its loans by $900. With fewer loans, there will be fewer deposits in other banks. The money multiplier working in reverse decreases the money supply.

However, there is one crucial difference between this example, in which one individual writes a check to another, and our earlier example, in which an individual makes a cash deposit: When Paul receives the check from Freda, the money supply will not be changed in the long run. Here’s why: When Freda’s check is deposited in Paul’s bank, the money supply will begin to expand, but when Freda’s bank loses its deposit, the money supply will start to contract. The expansions and contractions offset each other when private citizens and firms write checks to one another.

Let’s review an Application that answers a key question:

2. Why have banks recently started to hold vast amounts of excess reserves?

APPLICATION 2: THE GROWTH IN EXCESS RESERVES

Figure 13.5 illustrates the change in reserves held by banks as a result of a policy change in September 2008. Prior to that time, banks earned no interest on either required or excess returns and thus had an incentive to loan out as much money as possible. In September 2008, the Fed began paying interest on reserves. As a result of the opportunity to earn money on reserves, banks began holding significantly more dollars in reserves.

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13.3 A Banker’s Bank: The Federal Reserve

Congress created the Federal Reserve System in 1913 after a series of financial panics in the United States. Financial panics can occur when there is bad news about the economy or the stability of financial institutions. The Federal Reserve system is a central bank, a banker’s bank; an official bank that controls the supply of money in the economy. One of the Fed’s primary tasks is to serve as a lender of last resort, the last place, all others having failed, from which banks in emergency situations can obtain loans.

The Federal Reserve has several key functions:

- The Fed supplies currency to the economy.
- The Fed provides a system of check collection and clearing.
- The Fed holds reserves from banks and other depository institutions and regulates banks.
- The Fed conducts monetary policy, the range of actions taken by the Federal Reserve to influence the level of GDP or inflation.

When members of Congress created the Federal Reserve System, they were aware the institution would be very powerful. Consequently, they deliberately created a structure that attempted to disperse the power, moving it away from major U.S. financial centers (such as New York) to other parts of the country. Figure 13.6 shows where each of the 12 Federal Reserve Banks is located. A Federal Reserve Bank is one of 12 regional banks that are an official part of the Federal Reserve System. At the time the Fed was created, economic and financial power in this country was concentrated in the East and the Midwest.

There are two other subgroups of the Fed in addition to the Federal Reserve Banks. The Board of Governors of the Federal Reserve is the second subgroup. It is a seven-person governing body of the Federal Reserve System, headquartered in Washington, D.C. It is the true seat of power in the Federal Reserve System. Each member of the board is appointed for a 14-year term by the president. The chairperson of the Board of Governors serves a four-year term.

Study Tip

Go to www.federalreserve.gov/bios to learn more details about who runs the Federal Reserve.

The third subgroup of the Fed is the Federal Open Market Committee (FOMC), which makes decisions about monetary policy. The FOMC is a 12-person board consisting of the 7 members of the Board of Governors plus 5 of 12 regional bank presidents on a rotating basis. The president of the New York Federal Reserve Bank is always a voting member because open market operations are performed at the New York Fed. The other seven regional bank presidents attend and participate in each FOMC meeting but are not voting members of the FOMC.

Countries differ in the degree to which their central banks are independent of political authorities. The central banks in both the United States and the United Kingdom operate with considerable independence of elected officials. In other countries, the central bank is part of the treasury department of the government and potentially subject to more direct political control. Central banks that are not independent will always be under pressure to help finance their country’s government deficits by creating money. Independence, on the other hand, typically means less inflation.
13.4 What the Federal Reserve Does during a Financial Crisis

As the lender of last resort, the Fed can quell disturbances in the financial markets.

Let’s review two Applications that answer key questions:

3. How did the Fed manage to keep the financial system in operation immediately following the attacks on September 11, 2001?

APPLICATION 3: THE FINANCIAL SYSTEM UNDER STRESS: SEPTEMBER 11, 2001

The Fed was tested on September 11, 2001, following the terrorist attacks against the United States. Many financial firms keep little cash on hand and expect to borrow on a daily basis to pay their ongoing bills and obligations. When the financial markets closed after September 11, many of these firms were in trouble. To prevent a default avalanche, the Federal Reserve immediately took a number of steps to provide additional funds to the financial system. The first tool that the Federal Reserve used was to allow banks to borrow more. The difference between the credits and the debits extended by the Federal Reserve is called the “Federal Reserve float.” Immediately following September 11, the Federal Reserve allowed this float to increase sharply from $2.9 billion to $22.9 billion. These actions effectively put an additional $20 billion into the banking system. The Federal Reserve also purchased government securities in the marketplace and, as a result, put $30 billion into the hands of private citizens and their banks. It also arranged to provide dollars to foreign central banks such as the Bank of England to meet their own needs and the needs of their own banks to facilitate any dollar transactions they had during this crisis.

4. How did the Fed successfully respond to the collapse of major financial institutions in 2008?

APPLICATION 4: COPING WITH THE FINANCIAL CHAOS CAUSED BY THE MORTGAGE CRISIS

In March 2008, one of Wall Street’s most famous investment houses, Bear Stearns, had gone into full collapse. Although Bears Stearns had roughly $17 billion in readily available assets, it appeared this was not enough to satisfy the market. Other investment firms believed Bear Stearns had made so many poor investments that it was not financially viable. They rapidly began pulling out their funds from Bear Stearns. The Fed feared that a complete collapse of Bear Stearns would devastate the financial system and cause a global panic as investors would want to pull out their funds from all financial institutions, effectively causing a “run” in the financial markets. During the week following the collapse, the Fed began to search for ways to deal with this crisis. One solution was to try to convince another financial institution to take over Bear Stearns and keep the financial markets open. The problem, however, was that no one had a clear idea precisely what quality of assets Bears Stearns had on its balance sheet, and thus no firm wanted to be exposed to the risk of purchasing them. Finally, the Fed convinced the investment firm JPMorgan Chase & Co. to buy Bear Stearns—but only after the Fed agreed to loan Chase $30 billion. The Fed had successfully averted a major financial crisis but had put U.S. taxpayers at risk by lending such a large amount to a private investment house.

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Unfortunately, Bear Stearns was only an early symptom of a problem that increased in severity over the coming months. By September and October of 2008, the mortgage crisis had effectively spilled over into the world’s financial markets. The world’s financial markets were freezing up, stock markets were in sharp decline, and there was growing panic.

The Fed continued to develop new programs, such as purchasing the short-term debt of corporations—commercial paper—so that it effectively spread its lender of last resort function beyond financial institutions. It also began a program to extend loans to money market funds, some of which had come under financial pressure, and it started to make purchases of securities backed by mortgages in order to keep funds flowing to the housing sector. Finally, it began to pay interest on deposits held at the Fed, a move designed to induce banks to hold more reserves and increase the Fed’s own ability to make critical loans.

Taken together, these were sweeping changes to the Fed’s role in the financial system. The Fed has now abandoned its efforts to support the commercial paper market and money market funds but has maintained the other programs. Only time will tell whether the remaining changes, adopted during a two-month period, will become permanent tools of the Fed or will fade away when the economy eventually recovers.

Activity

How much will total checking accounts grow if you have an initial deposit of $5,000 in cash and a reserve ratio of 10 percent?
Answer

Using the equation below:

\[
\text{total increase in checking accounts in all banks} = (\text{initial deposit}) \times \frac{1}{\text{reserve ratio}}
\]

\[
\text{total increase in checking accounts in all banks} = 5,000 \times \frac{1}{0.10} = 50,000
\]

Key Terms

**Assets:** The uses of the funds of a bank, including loans and reserves.

**Balance sheet:** An account statement for a bank that shows the sources of its funds (liabilities) as well as the uses of its funds (assets).

**Barter:** The exchange of one good or service for another.

**Board of Governors of the Federal Reserve:** The seven-person governing body of the Federal Reserve System in Washington, D.C.

**Central bank:** A banker’s bank: an official bank that controls the supply of money in a country.

**Commodity money:** A monetary system in which the actual money is a commodity, such as gold or silver.

**Double coincidence of wants:** The problem in a system of barter that one person may not have what the other desires.

**Excess reserves:** Any additional reserves that a bank holds above required reserves.

**Federal Open Market Committee (FOMC):** The group that decides on monetary policy: It consists of the 7 members of the Board of Governors plus 5 of 12 regional bank presidents on a rotating basis.

**Federal Reserve Bank:** One of 12 regional banks that are an official part of the Federal Reserve System.

**Fiat money:** A monetary system in which money has no intrinsic value but is backed by the government.

**Gold standard:** A monetary system in which gold backs up paper money.

**Lender of last resort:** A central bank is the lender of last resort, the last place, all others having failed, from which banks in emergency situations can obtain loans.

**Liabilities:** The sources of funds for a bank, including deposits and owners’ equity.

**M1:** The sum of currency in the hands of the public, demand deposits, other checkable deposits, and traveler’s checks.

**M2:** M1 plus other assets, including deposits in savings and loans accounts and money market mutual funds.
Medium of exchange: Any item that buyers give to sellers when they purchase goods and services.

Monetary policy: The range of actions taken by the Federal Reserve to influence the level of GDP or inflation.

Money: Any items that are regularly used in economic transactions or exchanges and accepted by buyers and sellers.

Money multiplier: The ratio of the increase in total checking account deposits to an initial cash deposit.

Owners’ equity: The funds provided to a bank by its owners.

Required reserves: The specific fraction of their deposits that banks are required by law to hold as reserves.

Reserve ratio: The ratio of reserves to deposits.

Reserves: The portion of banks’ deposits set aside in either vault cash or as deposits at the Federal Reserve.

Store of value: The property of money that it preserves value until it is used in an exchange.

Unit of account: A standard unit in which prices can be stated and the value of goods and services can be compared.

Practice Quiz

(Answers are provided at the end of the Practice Quiz.)

1. When we say that money serves as a unit of account, we mean that
   a. money eliminates the double coincidence of wants that exists under barter.
   b. exchange is made through the use of money.
   c. prices are quoted in terms of money.
   d. All of the above are true.

2. As of June 2008, which of the components of the money supply, as measured by M1, was the largest?
   a. currency held by the public
   b. demand deposits
   c. other checkable deposits
   d. traveler’s checks

3. Credit cards are
   a. part of M1.
   b. part of M2.
   c. both in M1 and in M2.
   d. not part of the money supply.

4. On the balance sheet of a bank,
   a. reserves are on the liability side.
   b. loans are the most important asset.
c. deposits are the most important asset.
d. assets plus owners’ equity equal liabilities.

5. The name given to the fraction of deposits that banks are legally required to hold in their vaults or as deposits at the Fed is
   a. reserves.
   b. required reserves.
   c. excess reserves.
   d. total reserves.

6. Suppose that the reserve ratio is 25 percent and that banks loan out all their excess reserves. If a person deposits $100 cash in a bank, checking account balances will increase by a maximum of
   a. $25.
   b. $100.
   c. $400.
   d. $2,500.

7. Assume that banks are always fully loaned and people hold no cash. Given a required reserve ratio of 10 percent, an infusion of $100 billion in reserves will result in a maximum of
   a. $10 billion in deposits.
   b. $100 billion in deposits.
   c. $110 billion in deposits.
   d. $1,000 billion in deposits.

8. Assuming there are no leakages out of the banking system, a money multiplier equal to 5 means that
   a. the reserve ratio equals 5.
   b. an additional $5 of reserves create one dollar of deposits.
   c. each additional dollar of deposits creates $5 of reserves.
   d. each additional dollar of reserves creates $5 of deposits.

9. The money multiplier for the United States is
   a. between 2 and 3.
   b. approximately 10.
   c. a negative number since the financial crisis of 2008.
   d. impossible to measure, as money multipliers are only calculated on a global basis.

10. Which of the following facts is true about the creation of the Federal Reserve System (the Fed)?
    a. The Fed was created in 1913.
    c. Congress created the Federal Reserve to be a central bank, serving as a banker’s bank.
    d. All of the above are true.

11. When we say that one of the functions of the Fed is to be a lender of last resort, we mean that
    a. the Fed serves as a clearinghouse for interbank payments.
    b. the Fed ensures that banks are financially sound.
    c. the Fed sets reserve requirements.
    d. the Fed provides funds to troubled banks that cannot find any other sources of funds.

12. How many Federal Reserve districts are there?
    a. 48
    b. 25
c. 50
d. 12

13. Fill in the blanks. The Board of Governors of the Federal Reserve has ______ members who are appointed for staggered ______ by the _________ and must be confirmed by the __________.
   a. 7; 14-year terms; president; Senate
   b. 14; 7-year terms; Senate; president
   c. 12; 4-year terms; Congress; president
   d. 14; 4-year terms; House of Representatives; Senate

14. Who is the chairperson of the Federal Open Market Committee (FOMC)?
   a. the president of the New York Federal Reserve Bank
   b. the chairperson of the Board of Governors
   c. any of the presidents of the Federal Reserve Banks
   d. any of the members of the Board of Governors

15. Which body of the Federal Reserve System sets the majority of U.S. monetary policy?
   a. the Board of Governors
   b. the Federal Open Market Committee
   c. the 12 Federal Reserve Banks in each district
   d. the Open Market Desk

16. This question tests your understanding of Application 3 in this chapter: The financial system under stress: September 11, 2001. How did the Fed manage to keep the financial system in operation immediately following the attacks on September 11, 2001?

   The Fed was tested on September 11, 2001, following the terrorist attacks against the United States. Many financial firms keep little cash on hand and expect to borrow on a daily basis to pay their ongoing bills and obligations. When the financial markets closed after September 11, many of these firms were in trouble.

   How did the Fed react to the attacks of September 11, 2001?
   a. The Federal Reserve allowed banks to borrow more.
   b. The Federal Reserve allowed the “Federal Reserve float” to increase sharply.
   c. The Federal Reserve purchased government securities in the marketplace.
   d. All of the above are true.

17. Define and briefly explain the concept of the money multiplier.

18. Among the missions of the Fed is to serve as a lender of last resort. Briefly explain what this means.

19. Why is central bank independence important for the proper performance of the economy?
Answers to the Practice Quiz

1. c. Unit of account is the property of money that prices are quoted in terms of money. Money provides a convenient measuring rod when prices for all goods are quoted in money terms. Money can be used to compare the relative value of goods, making it easier to carry out economic transactions.

2. a. $735 billion, or 53 percent of M1, was currency held by the public. With 300 million people in the United States, the $735 billion of currency held by the public amounts to $2,450 per person. However, most people don’t hold such a large amount of cash. Much of this currency is held abroad.

3. d. While credit cards are commonly used in our economy to make transactions, they are not part of the money supply.

4. b. Loans are usually the largest asset. The business of the bank is to profit from the difference between interest received on loans and interest paid on deposits.

5. b. Required reserves are the fraction of banks’ deposits they are legally required to hold in their vaults or as deposits at the Fed.

6. c. The money multiplier is 1/reserve ratio, or $100 × 4 = $400 in new checking accounts.

7. d. The money multiplier shows the relationship between the final change in deposits and the change in reserves that caused it.

8. a. The actual value of the money multiplier in the United States is between 2 and 3, smaller than the value of 10 implied by the simple formula in the text because not all loans make their way into checking accounts, so are therefore not available for banks to lend out.

9. d. The Federal Reserve System was created in 1913 following a series of financial panics in the United States. Congress created the Federal Reserve to be a central bank, serving as a banker’s bank.

10. d. The Fed stands ready to provide funds to a troubled bank that cannot find any other sources of funds.

11. d. The United States was divided into 12 Federal Reserve districts, each of which has a Federal Reserve Bank.

12. a. Headquartered in Washington, D.C., the seven members of the board are appointed for staggered 14-year terms by the president and must be confirmed by the Senate.

13. b. The chairperson of the Board of Governors also serves as the chairperson of the FOMC.

14. b. The FOMC consists of the Board of Governors, the president of the New York Federal Reserve Bank and, on a rotating basis, 4 of the presidents of the 11 other district banks.
16. d. The Federal Reserve took a number of steps to provide additional funds to the financial system, including increasing loans to banks, increasing the float, and purchasing government securities in the marketplace.

17. The money multiplier is the inverse of the required reserve ratio. The money multiplier shows the total increase in checking account deposits for any initial cash deposit. The initial cash deposit triggers additional rounds of deposits and lending by banks, which leads to a multiple expansion of deposits. When people hold part of their loans as cash, the money multiplier is smaller. This cash is not available for the banking system to lend.

18. The Fed is a lender of last resort because it stands ready to provide funds to a troubled bank that cannot find any other sources of funds. Despite the existence of FDIC insurance, banks are still subject to the possibility of bank runs. The Fed is the ideal lender of last resort because it is a nonprofit institution that serves the welfare of the public and because it has an essentially unlimited supply of funds.

19. Central bank independence refers to the ability of central banks to make decisions regarding monetary policy without interference from the government. The government could try to manipulate the money supply in ways that are beneficial for the current administration but harmful for the economy in the long run. For example, suppose that the economy is at full employment, with unemployment at around 5 percent or so. The Fed could be persuaded to increase the money supply, say 6 to 9 months, prior to an election. By the time the election occurs, the economy could reach a lower rate of unemployment, below the natural rate. Although the reduction in unemployment looks good in the short run, the result in the long run will only be higher inflation. For this reason, the central bank and the executive branch of government should remain distant from each other. Independence increases the credibility of the banking authority, which is interpreted in financial markets as a sign of economic strength.