

# **PART IV**

## **Monetary Economics**

# Chapter 10

## Fiscal Policy

*After reading this chapter, you will understand:*

1. What money is and what it does.
2. How the stock of money in the economy is measured.
3. The structure of the U.S. banking system.
4. How the safety and stability of the banking system are maintained.

*Before reading this chapter, make sure you understand the meaning of:*

1. Financial intermediaries
2. The role of money in the circular flow

### **WHERE LIFE IS EASY AND THE CURRENCY IS HARD**

On the tiny South Pacific island of Yap, life is easy and the currency is hard.

Elsewhere, the world's troubled monetary system creaks along; floating exchange rates wreak havoc in currency markets, and devaluations are commonplace. But on Yap, the currency is as solid as a rock. In fact, it is a rock. Limestone, to be precise.

For nearly 2,000 years, the Yapese have used large stone wheels to pay for major purchases, such as land, canoes, and permission to marry. Yap is a U.S. trust territory, and the dollar is used in grocery stores and gas stations. But reliance on stone money, like the island's ancient caste system and the traditional dress of loincloths and grass skirts, continues.

Stone wheels don't make good pocket money, so for small transactions the Yapese use other forms of currency, such as beer. Beer is proffered as payment for all sorts of odd jobs, including construction. Besides stone wheels and beer, the Yapese sometimes spend "gaw," consisting of necklaces of stone beads strung together around a whale's tooth. They also can buy things with "yar," a currency made from large seashells. But these are small change.

The people of Yap have been using stone money ever since a Yapese warrior named Anagumang first brought the huge stones over from limestone caverns on neighboring Palau, some 1,500 to 2,000 years ago. Inspired by the moon, he fashioned the stones into large circles. The rest is history.

By custom, the stones are worthless when broken. Rather than risk a broken stone—or back—Yapese tend to leave the larger stones where they are and make a mental accounting that the ownership has been transferred—much as gold bars used in international transactions change hands without leaving the vault of the New York Federal Reserve Bank.

Just three decades ago, Yap was little changed from the way it had been for centuries. But now things are changing. To help preserve the tradition of stone money, Andrew Ken, a Yapese monetary thinker, is trying to persuade the Yap government to start a stone money exchange. This would allow the Yapese to trade their boulders for dollars, or buy them back, whenever they wish. “We’re losing because we can’t liquidate,” Ken complains. Currently, the U.S. dollar is the official currency of the Yap Islands, but the stone money is still used for traditional exchanges such as the purchase of land or in village ceremonies.

Source: Art Pine, “Fixed Assets, or: Why a Loan in Yap Is Hard to Roll Over,” *The Wall Street Journal*, March 29, 1984, 1. Reprinted by permission of *The Wall Street Journal*, © 1984 Dow Jones & Company, Inc. All Rights Reserved Worldwide.

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MONEY IS THE fluid that moves in the circular flow of income and product. Money can take many forms: giant stones on the Pacific island of Yap; gold coins throughout much of the world in earlier centuries; electronic entries in banks’ computers in the United States today; and even in computer simulation games such as Sims and EverQuest.

Although we have mentioned money often, in this and the following chapters we give it center stage. We will begin by defining money and explaining how it is measured. Next we will explore the banking system. Later in this text we will see how the Federal Reserve, a government agency, controls the stock of money. We will also turn to a discussion of the demand for money and how that demand interacts with supply. Finally, we will see that changes in the money stock can have a strong impact on the decisions of households, firms, and government units. By the end of these discussions, it will be clear why a stable monetary system is a crucial part of national economic policy.

## **MONEY: WHAT IT IS AND WHAT IT DOES**

**Money** is best defined in terms of what it does: It serves as a means of payment, a store of purchasing power, and a unit of account. Money serves these functions regardless of its name or form—U.S. dollars, Japanese yen, or Yapese stone wheels can all function in all three ways.

### ***The Functions of Money***

As a means of payment, money reduces the costs of carrying out transactions. Using money avoids the complexities of barter. Imagine a market in which farmers meet to trade produce of various kinds. Apples will get you peppers, cauliflower will get you beets, and turnips will get you garlic. But what if you want garlic and have only potatoes? What you need is a universal

means of exchange—one that all sellers will accept because they know that others will also accept it; one that is in limited supply so that you know its exchange value will remain constant; and one that is easily recognized and hard to counterfeit. The Yapese find that stone wheels work well for large transactions, and they use “yar” or “gaw” for small ones. In the United States, coins and paper currency serve as pocket money while bank deposits, which can be transferred by check or computer networks, are used for bigger business deals.

As a store of purchasing power, money makes it possible to arrange economic activities in a convenient manner over time. Income-producing activities and spending decisions need not occur simultaneously. Instead, we can accept money as payment for our work and keep the money handy until we want to spend it. The U.S. dollar is a fairly good store of purchasing power, although in some periods its purchasing power has been undermined by inflation. Yapese stone wheels evidently work even better—they have held their value for centuries.

Finally, as a unit of account money makes it possible to measure and record economic stocks and flows. A household’s needs for food, shelter, and clothing can be expressed in dollar terms. The nation’s output of movies, apples, and airplanes can be added together in dollar terms. Without money as a unit of account, private and public economic planning would be virtually impossible.

### ***Money as a Liquid Asset***

Anything of value can serve as a store of purchasing power if it can be sold and the proceeds can be used to buy something else. Money, however, has two important traits that no other asset has, at least not to the same extent. One is that money itself can be used as a means of payment without first having to be exchanged for something else. A house, a corporate bond, or a blast furnace may have great value, but they can rarely be traded without first being exchanged for an equivalent amount of money. The other trait is that money can neither gain nor lose in nominal value; this is necessarily so, because money is the unit of account in which nominal values are stated. Thus, a house, a bond, or a blast furnace may be worth more or fewer dollars next year than this year, but the nominal value of a dollar is always a dollar—no more and no less.

An asset that can be used as or readily converted into a means of payment and is protected against gain or loss in nominal value is said to have **liquidity**. No other asset is as liquid as money. In fact, a comparison of the definitions of money and liquidity suggests that any perfectly liquid asset is, by definition, a form of money.

### ***Measuring the Stock of Money***

For purposes of economic theory and policy, we need to know not only what money is but also how it can be measured. In all modern economies the stock of money is controlled by government. As we will see, if government fails to supply enough money, real output and employment will decrease, at least temporarily. On the other hand, flooding the economy with

too much money causes inflation. Because the money stock cannot be controlled if it cannot be measured, the problem of measurement is an important one.

**CURRENCY AND TRANSACTION DEPOSITS** We begin with a rather restrictive definition that views money as consisting of just two highly liquid types of assets: currency and transaction deposits. **Currency** includes coins and paper money. **Transaction deposits**—popularly known as *checking accounts*—are deposits from which money can be withdrawn by check or electronic transfer without advance notice and used to make payments.

In the United States, currency consists of the familiar Federal Reserve notes, which are issued in denominations of \$1, \$2, \$5, \$10, \$20, \$50, and \$100, and of coins minted by the Treasury. Coins and paper money were formerly backed by precious metals. Until 1934, the U.S. government issued both gold coins and paper currency that could be exchanged for gold on demand; silver coins and silver-backed paper money survived until the mid-1960s. Today, coins and paper money are simply tokens whose value is based on the public's faith in their usefulness as means of paying for goods and services. In this regard, the use of dollars in the United States is no different from the use of stone wheels on the island of Yap.

Transaction deposits are available in a number of forms. One major type of transaction deposit is the *demand deposit*. By law, demand deposits cannot pay interest, but banks compensate demand-deposit customers with various services. Until the mid-1970s, demand deposits were the only kind of transaction deposit available in the United States and were offered only by **commercial banks**. They have since been joined by a variety of interest-bearing checkable deposits, notably negotiable order of withdrawal or NOW accounts. These are available to consumers through commercial banks and **thrift institutions (thrifts)**—savings and loan associations, savings banks, and credit unions. Banks and thrifts are referred to collectively as **depository institutions**. (We will look at these institutions in more detail later in the chapter.)

As Table 10.1 shows, in the fall of 2002 demand deposits made up roughly half of the total transaction deposits, with all other checkable deposits accounting for the other half. Currency plus all forms of transaction deposits totaled \$1,202.2 billion as of November 2002. The sum of currency and transaction deposits is known as **M1**.

Some readers may find it odd that credit cards are not included in the monetary aggregates. After all, from the consumer's point of view, paying for a purchase with a credit card is a close substitute for paying by cash or check. *Applying Economic Ideas 10.1* discusses the nature of credit cards and explains why they do not figure in the measurement of the nation's money stock.

**Table 10.1 Components of the U.S. Money Stock, November 2002 (Billions of Dollars, Seasonally Adjusted)**

Currency		\$623.6	
+ Travelers checks		\$7.5	
+ Transactions deposits		\$571.1	
Demand deposits	\$294.5		
Other checkable deposits	\$276.6		
= M1			\$1,202.2
+ Savings deposits (including MMDAs)		\$2,743.6	
+ Small-denomination time deposits		\$898.1	
+ Retail money market fund shares		\$933.4	
= M2			\$5,777.3

This table breaks down the U.S. money supply into its components as of November 2002. It gives two of the most commonly used money supply measures. M1 is the total of currency and transaction deposits; M2 includes M1 plus other highly liquid assets.

Source: Board of Governors of the Federal Reserve System, H.6 *Statistical Release*, December 18, 2003.

**THE BROADLY DEFINED MONEY STOCK** The rationale behind the narrow definition of the money stock, M1, is that almost all transactions are made with either currency or transaction deposits. However, if one chooses to focus on the function of money as a store of value rather than as a means of payment, there are a number of other assets that are almost as liquid as the components of M1 and serve as close substitutes for them.

Shares in money market mutual funds are one example. A *money market mutual fund* is a financial intermediary that sells shares to the public. The proceeds of these sales are used to buy short-term, fixed-interest securities such as Treasury bills. Almost all the interest earned on securities bought by the fund is passed along to shareholders. (The fund charges a small fee for its services.) Shareholders can redeem their shares in a number of ways—by writing checks on the fund (usually in amounts above a minimum of \$500), by telephone transfer, or by transfer to another fund.<sup>1</sup> Because the proceeds from sales of shares are invested in very safe short-term assets, a money market mutual fund is able to promise its shareholders a fixed nominal value of \$1 per share, although the interest paid on the shares varies with market rates. Except for the minimum-amount requirement on checks, then, money market mutual fund balances are almost as liquid as those of ordinary transaction accounts. Money market funds grew rapidly in the late 1970s and early 1980s, when market interest rates rose while rates paid by banks and thrifts were limited by federal regulations.

Banks and thrifts also offer a number of other accounts that serve as reasonably liquid stores of purchasing power. **Savings deposits** are a familiar example. Although checks cannot be written on these deposits, they are fully protected against loss in nominal value and can be redeemed at any time. In addition to conventional savings deposits, since late 1982 banks and thrifts have been allowed to compete with money market mutual funds by offering so-called

*money market deposit accounts (MMDAs)*. These accounts have limited checking privileges and offer higher interest rates than the transaction accounts included in M1. Their volume grew very rapidly after their introduction. As Table 10.1 shows, savings deposits and MMDAs together totaled \$2,743.6 billion in November 2002.

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## Applying Economic Ideas 10.1

### “PLASTIC MONEY”

Recent innovations in banking have streamlined how people make payments and have reduced their reliance on using paper currency. For instance, instead of writing a check as a means of payment, individuals can use a debit card or a credit card. Many people wonder how this “plastic money”—the MasterCard, VISA cards, and other bank cards that so many people carry these days—fits into M1 and M2. Just what role do these cards play in the payments system?

*Credit cards*, the most common type of plastic money, are not really a form of money at all. What sets credit cards apart from currency, bank deposits, and other forms of money is the fact that they are not a store of value. Instead, they are documents that make it easy for their holders to obtain a loan.

When you go into a store, present your credit card, and walk out with a can of tennis balls, you have not yet paid for your purchase. What you have done is borrow from the bank that issued the card. At the same time, you have instructed the bank to turn over the proceeds of the loan to the store. Later the bank will send money to the store (either in the form of a check or by crediting the amount to the store’s account). This will pay for the tennis balls. Still later you will send money to the bank to pay off the balance on your credit card account.

Another common form of plastic money is a *debit card*. A debit card directly withdraws money from the payer’s bank account and deposits these funds into the receiver’s account. The funds are verified electronically, which substantially reduces the time and cost needed to clear a check. Similarly, many students in colleges today can use their student identification card as a stored-value card, or “smart card.” Stored-value cards are much like debit cards except that they generally draw on funds stored with the card’s administrator (such as the college/university issuing student I.D. cards) rather than in a bank account. Because stored-value and debit cards draw on funds the cardholder has deposited (in a checking or school account), they are considered money.

Many businesses operating on the internet accept electronic cash and electronic checks. These are much like their paper counterparts, cash and checks, except the transactions take place electronically over the internet. For example, rather than writing a paper check to pay for something in a store, you can order the same good over the internet and provide your check number to paybank account information to pay.

The obvious drawback to electronic money is that it increases the likelihood of fraud. It is more difficult to verify the person’s identity without photo identification or other personal

information. Also, businesses using electronic money gain access to additional personal information not usually provided when using paper cash or checks.

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Banks and thrifts also offer **time deposits**. In the case of small-denomination time deposits (up to \$100,000), funds typically must be left on deposit for a fixed period, ranging from less than a month to many years, in order to earn the full interest rate, and they normally cannot be transferred to another person before maturity. This feature makes them less liquid than savings deposits or MMDAs, but in return they usually pay a higher interest rate. They, too, are protected against loss of nominal value.

Retail money market mutual fund shares, MMDAs, savings deposits, and small-denomination time deposits are added to M1 to create a measure of the money supply known as **M2**. As Table 10.1 shows, M2 amounted to **\$5,777.3** billion in November 2002.

Besides M1 and M2, there are other, still broader measures. M3 includes such items as large-denomination time deposits (\$100,000 and up) and other liquid assets.

### ***Why Money Matters***

In presenting alternative measures of the money stock, we might seem to have wandered rather far afield from our main macroeconomic themes of price stability, real output, and employment. In fact, however, these key variables are closely related to money. Much of the next three chapters will be devoted to showing why this is so, but a preliminary overview can be given here.

THE EQUATION OF EXCHANGE The relationship between money and other key variables can be stated in the form of the following equation, which is termed the **equation of exchange**:

$$MV = Py$$

where M stands for a measure of the money stock, P for the price level, and y for real domestic product. The remaining variable, V, stands for **velocity** or, more fully, the **income velocity of money**. Velocity can be thought of as the average number of times each dollar of the money stock is spent each year for income-producing transactions. It can also be thought of as the ratio of nominal domestic product to the money stock.<sup>2</sup> For example, if a country had a money stock of \$200 billion and a real domestic product of \$1,000 billion, velocity would be 5, indicating that each dollar of the money stock changed hands about 5 times a year for purchases of final goods and services.

The equation of exchange shows that any change in the money stock must affect the price level, real output, velocity, or some combination of these variables. Thus, control over the money stock gives the government another policy instrument with which to influence key macroeconomic variables. Later chapters will show in detail the means by which policymakers

can influence the money stock. They will also discuss the effects of changes in the money stock on other variables.

WHICH “M” IS BEST? As we have seen, there are various measures of the money stock. All of these measures are determined by establishing a cutoff point along a range of financial assets with varying degrees of liquidity, from currency at one end to long-term securities at the other. No hard-and-fast answer can be given to the question of which M is “best” without also asking, “Best for what?”

As mentioned earlier, the basic idea of M1 is to measure the money stock available for use as a means of payment. However, it does not do this perfectly. On the one hand, some consumers use interest-bearing transaction accounts, such as NOW accounts, primarily as a store of purchasing power. This savings motive is reflected in the fact that some of these accounts have a low *turnover rate*—that is, the ratio of the volume of transactions per year to the average balance is low. On the other hand, as we have seen, money market mutual funds and MMDAs have limited checking features that allow them to serve as means of payment. These assets are not included in M1 partly because they have even lower turnover rates, but they are still used for some transactions. Thus, M1 is far from perfect as a measure of means-of-payment money.

Similar problems plague M2, which is intended to measure the stock of money as a short-term, highly liquid store of purchasing power. M2 includes items such as savings and small-denomination time deposits, which have fixed nominal values despite their low turnover rates. But the cutoff line between M2 and M3—for example, the \$100,000 cutoff for time deposits—is arbitrary.

For purposes of macroeconomic modeling and policy, the best money stock measure would be the one with the most predictable velocity and, hence, the most predictable relationship to the variables lying on the right-hand side of the equation of exchange—that is, real output and the price level. For many years economists were confident that M1, whatever its imperfections, was the best available measure in this regard. In the 1980s, as banking institutions and ways of doing business changed, M1 began to lose its close relationship to other economic variables, and M2 became a better measure. In this book, unless we specify otherwise, the term *money* can be understood to refer to M2.

## THE BANKING SYSTEM

As Table 10.1 shows, less than 30 percent of M2 consists of currency issued by the federal government and money market mutual funds. Most of the other components of M2—transaction deposits, savings deposits and MMDAs, and small-denomination time deposits—are issued by commercial banks and thrifts. For this reason, an understanding of monetary theory and policy requires a knowledge of the structure and operations of depository institutions.

## ***Types of Depository Institutions***

There are four principal types of depository institutions in the United States. They differ in the types of loans and deposits in which they specialize, although their operations increasingly overlap.

The largest group of depository institutions is *commercial banks*. These usually include the word *bank* in their names. One of their specialties is making commercial loans—that is, loans to businesses, frequently short term. They also make consumer loans and home mortgage loans. Until the 1970s, commercial banks were the only institutions that could offer checking accounts, and they still hold the bulk of transaction deposits. They also raise funds by offering savings and time deposits and other financial instruments. Large commercial banks provide many services, such as wire transfers and international banking facilities, to business customers.

*Savings and loan associations* (also known as *savings and loans* or *S&Ls*) specialize in home mortgage lending, although they also make other real estate loans, consumer loans, and a limited number of commercial loans. Household savings and time deposits have traditionally been their main source of funds, but today they also offer fully checkable deposits as well as MMDAs with limited checking privileges. Although they may not use the word *bank* in their names, some savings and loan associations shape their operations to resemble those of commercial banks as closely as regulations permit.

*Mutual savings banks* are a type of depository institution that emerged in the nineteenth century to serve the needs of working-class households needing a depository for their small amounts of savings. Some still have names that reflect these origins, such as “Dime Savings Bank.” Mutual savings banks offer the same range of deposits as savings and loan associations, but they tend to offer more diversified types of loans.

*Credit unions* are small financial intermediaries organized as cooperative enterprises by employee groups, union members, or certain other groups with shared work or community ties. They specialize in small consumer loans, although a few also make mortgage loans. They offer both transaction and savings deposits.

Since the mid-1970s, the traditional distinctions among these four types of institutions have eroded. Today, both from the viewpoint of the consumer and in macroeconomic terms, there is no real difference between a transaction deposit in a commercial bank and one in a thrift institution. Therefore, we will use the terms *bank* and *banking system* to refer to all depository institutions except when there is a particular reason to single out one type of institution.

## ***The Banking Balance Sheet***

The operations of a commercial bank can best be understood by reference to its balance sheet. A firm’s or household’s **balance sheet** is a financial statement showing what it owns and what it owes, or, to use more technical language, its *assets*, *liabilities*, and *net worth*. **Assets**, which are listed on the left-hand side of the balance sheet, are all the things that the firm or household owns or to which it holds a legal claim. **Liabilities**, which are listed on the right-hand side of the

balance sheet, are all the legal claims against a firm by non-owners or against a household by nonmembers. **Net worth**, also listed on the right-hand side of the balance sheet, is equal to the firm's or household's assets minus its liabilities. In a business firm, net worth represents the owners' claims against the business. *Equity* is another term that is often used to refer to net worth. In banking circles net worth is often referred to as *capital*.

The balance sheet gets its name from the fact that the totals of the two sides always balance. This follows from the definition of net worth. Because net worth is defined as assets minus liabilities, liabilities plus net worth must equal assets. In equation form, this basic rule of accounting reads as follows:

$$\text{Assets} = \text{Liabilities} + \text{Net worth}$$

Table 10.2 shows a total balance sheet for U.S. commercial banks. Balance sheet items for thrift institutions would differ in amount, but the concepts involved would be the same.

**ASSETS** On the assets side of the balance sheet, the first line lists the non-interest-bearing deposits that banks maintain with the Federal Reserve System (which we will look at in more detail shortly), as well as vault cash, which is currency that banks keep in their own vaults. Deposits at the Federal Reserve plus vault cash constitute a bank's **reserves**. Historically, banks held reserves of cash or deposits that could be quickly converted into cash because at any moment some depositors might want to withdraw their funds. Today the minimum level of reserves is not left to the judgment of banks; rather, federal regulations require banks to hold reserves equal to a certain percentage of transaction deposits. The Federal Reserve's power to regulate the level of reserves in the banking system is a major tool of monetary policy. Other cash assets, also included in line one of the balance sheet and sometimes known as *secondary reserves*, give banks the liquidity to meet unexpected needs.

The next two items on the assets side of the balance sheet show the banks' main income-earning assets. The largest item is loans made to firms and households. In addition, commercial banks hold a substantial quantity of securities, including securities issued by federal, state, and local governments. The final item on this side includes some smaller income-earning items plus the value of the banks' buildings and equipment.

**LIABILITIES** The first two items on the liabilities side of the banks' balance sheet are various kinds of deposits. They are liabilities because they represent funds to which depositors hold a legal claim. Funds that banks have borrowed are also liabilities. A small portion of these are borrowed from the Federal Reserve and the rest from private sources. Because the banks' total liabilities are less than their assets, they have a positive net worth. This sum represents the claim of the banks' owners against the banks' assets.

**Table 10.2 Total Balance Sheet for U.S. Commercial Banks, December 10, 2003 (Billions of Dollars)**

<b>Assets</b>		<b>Liabilities</b>	
Reserves and cash items	\$322.2	Transaction deposits	\$624.2
Securities	\$1,841.2	Nontransaction deposits	\$4,122.2
Loans <sup>a</sup>	\$4,373.3	Bank borrowing	\$1,426.9
Other assets	\$792.0	Other liabilities	\$574.4
<b>Total assets</b>	<b>\$7,328.7</b>	<b>Total liabilities</b>	<b>\$6,747.7</b>
		Net worth	\$581.0
		<b>Total liabilities plus net worth</b>	<b>\$7,328.7</b>

This table shows the total balance sheet for all U.S. commercial banks as of December 10, 2003. Assets of banks include non-interest-bearing reserves and interest-bearing loans<sup>a</sup> and securities. Liabilities include deposits of all kinds and other borrowings. Net worth equals assets minus liabilities. The balance sheets of thrift institutions would show the same basic categories but would differ in details.

<sup>a</sup>Losses from loans are included in "Other assets"; loans are reported gross of these losses.

Source: Board of Governors of the Federal Reserve System, H.8 *Statistical Release*, December 19, 2003.

### ***The Federal Reserve System***

We have already mentioned the Federal Reserve System, or the *Fed*, as it is known in financial circles. The Fed is the central banking system of the United States. It provides banking services to private banks and to the federal government. It is one of the chief regulators and supervisors of the banking system. Its responsibility for monetary policy makes it a major partner with Congress and the executive branch in macroeconomic policymaking.

The Fed was established in 1913 as an independent agency of the federal government and therefore is not under the direction of the executive branch. It is subordinate to Congress, but Congress does not intervene in its day-to-day decision making. The reason for making the Fed independent was to prevent the U.S. Treasury Department from using monetary policy for political purposes. In practice, however, the Fed's monetary actions are coordinated with the Treasury's fiscal actions. The chair of the Fed's Board of Governors is in frequent contact with the secretary of the Treasury, the chair of the President's Council of Economic Advisers, and the director of the Office of Management and Budget. By law, the Fed also presents a formal report on monetary policy to Congress twice a year. It also explains how its monetary policy objectives are related to economic conditions and to the economic goals set by the administration and Congress.

**FEDERAL RESERVE BANKS** The Federal Reserve System is composed of 12 Federal Reserve district banks. Each serves a particular district of the country. The cities in which Federal Reserve Banks are located are Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Minneapolis, Kansas City, Dallas, and San Francisco. An additional 25 cities, including Seattle, Denver, Cincinnati, Miami, and others, have branches of the Federal Reserve Bank in their district.

Each Federal Reserve bank is a separate unit chartered by the federal government. Its stockholders are commercial banks that are members of the Federal Reserve System. Although Federal Reserve banks issue stock to their members, they are not typical private firms in that they are neither operated for profit nor ultimately controlled by their stockholders. The Federal Reserve banks earn income from their holdings of federal securities and, since 1981, from charges for services provided to banks and thrift institutions. Each year the Fed district banks return all their income, minus operating costs, to the Treasury.

Each bank is managed by a nine-member board. Six of those members are selected by the member banks; the other three are appointed by the Fed's Board of Governors. Each board sets the policies of its own bank under the supervision of the Board of Governors. The Board of Governors also approves the appointments of each Reserve bank's top officers.

The Federal Reserve banks perform a number of important functions in the banking system. These include operating a wire system for electronic funds transfers, clearing checks, handling reserve deposits, and making loans to depository institutions. They also issue paper currency in the form of Federal Reserve notes and supply Treasury coins. Finally, they provide banking services to the Treasury.

**THE BOARD OF GOVERNORS** The head of the Federal Reserve System is its Board of Governors. The Board, which supervises the 12 Federal Reserve banks, is comprised of seven members who are appointed by the president and confirmed by the Senate. Each governor serves a single 14-year term, with one term expiring every other year. The president appoints one of the board members to serve as chair for a four-year term.

The Board of Governors has the power to approve changes in the interest rate on loans made to banks and thrifts by the Fed district banks. It also sets, within limits determined by law, the minimum level of reserves that banks and thrifts are required to hold relative to certain deposits. The Board supervises and regulates many types of banking institutions, including state-chartered member banks, bank holding companies, and U.S. offices of foreign banks. It also approves bank mergers and implements consumer credit regulations.

**THE FEDERAL OPEN MARKET COMMITTEE** Authority over purchases and sales of government securities held by the Fed—its most important monetary policy tool—rests with the Federal Open Market Committee (FOMC). The FOMC is made up of the seven members of the Board of Governors plus five district bank presidents. The president of the Federal Reserve Bank of New York is a permanent member; the remaining four seats rotate among the other 11 district

banks. The committee meets eight times a year (and also confers by telephone) to set a general strategy for monetary policy. Committee decisions regarding changes in the Fed's holdings of securities are carried out through the open market trading desk at the Federal Reserve Bank of New York.

**MEMBER AND NONMEMBER BANKS** Approximately two-fifths of the 8,621 commercial banks in the United States belong to the Federal Reserve System. National banks must be members; state-chartered banks may join if they meet certain requirements. The member banks serve as stockholders of their district Federal Reserve Bank. Until 1980, member banks enjoyed certain privileges and received free services from the Fed, but in return they were subject to generally stricter regulation than nonmember banks.

In 1980 Congress passed the Depository Institutions Deregulation and Monetary Control Act, which did away with many of the distinctions between member and nonmember banks and between commercial banks and thrift institutions. As a result, since 1980 member banks, nonmember commercial banks, savings and loans, savings banks, and credit unions have all been subject to more uniform reserve requirements. In return for tighter regulation of reserves, thrift institutions won the right to compete more directly with commercial banks in making certain types of loans and offering transaction accounts. Nonmember depository institutions achieved access to Fed services such as check clearing, wire transfers, and loans on the same terms as member banks. In 1982 small depository institutions were exempted from reserve requirements. Thus, as a result of the Monetary Control Act, the distinction between banks and thrift institutions became less important.

**THE FED'S BALANCE SHEET** Table 10.3 shows a balance sheet for the Federal Reserve System. Government securities are by far the Fed's largest asset. These security holdings play a key role in the Fed's control of the money stock. Loans to banks and thrifts are small compared with other assets, but they are listed separately because they are important for policy purposes. Normally these loans are made to depository institutions on a short-term basis to enable them to meet their reserve requirements. However, in special circumstances longer-term loans are made to banks and thrifts that are experiencing a seasonal need for funds or are having financial difficulties. Other assets include some denominated in foreign currencies; these are important in carrying out the Fed's functions in the international monetary system.

Federal Reserve notes, which account for almost all of the nation's stock of currency, are the Fed's largest liability. These are followed by the reserves deposited with the Fed by banks and thrifts. Other liabilities include deposits of the Treasury and of foreign central banks. Because the Fed's assets exceed its liabilities, it has a positive net worth.

**Table 10.3 Consolidated Balance Sheet of the Federal Reserve Banks, December 17, 2003  
(Billions of Dollars)**

<b>Assets</b>		<b>Liabilities</b>	
Securities	\$690.95	Fed notes in circulation	\$681.65
Loans to banks	\$0.05	Bank deposits (reserves)	\$26.51
Other assets	\$63.81	Other liabilities plus net worth	\$46.65
<b>Total assets</b>	<b>\$754.81</b>	<b>Total liabilities plus net worth</b>	<b>\$754.81</b>

The Federal Reserve banks have liabilities to the general public in the form of Federal Reserve notes and to banks and thrifts in the form of reserve deposits. The Fed's main assets are government securities. Loans to banks with which to meet reserve requirements are small, but they are a key aspect of banking and monetary policy.

Source: Board of Governors of the Federal Reserve System, H.41 *Statistical Release*, December 18, 2003.

## **ENSURING THE SAFETY AND STABILITY OF THE BANKING SYSTEM**

Banks play a vital role in our economy, yet we often take them for granted until they experience problems. Unfortunately, parts of the banking system have experienced serious problems in recent years. Headlines about bank and thrift failures and financial wrongdoing have become all too common. This section looks at the sources of these failures and also at the policies used by government to ensure that the problems of individual institutions do not threaten the safety and stability of the banking system as a whole.

### ***Risks of Banking***

Banks earn a profit by lending the proceeds from the deposits they receive or by using the proceeds to buy securities at interest rates higher than those they pay to depositors. Banks have been earning profits in this way for hundreds of years, but there are some well-known risks involved.

One is the risk of loan losses. What happens if a bank makes a loan to a customer who is unable to repay it? When a loan goes bad, the bank's net worth is reduced by an equal amount. (In balance-sheet terms, writing off the bad loan is a reduction in assets. Liabilities—that is, deposits and borrowing—do not change. Therefore, net worth, which equals assets minus liabilities, must fall.) If loan losses are too great, the bank's net worth may fall below zero. At that point the bank will no longer have enough assets to pay off all of its depositors and other

creditors. A bank whose liabilities exceed its assets is said to be *insolvent* and usually must cease doing business.

A second risk that banks face is *insufficient liquidity*, that is, having insufficient liquid assets to cover withdrawals. When a depositor withdraws funds from a bank, the bank pays partly by drawing on the reserves it holds on deposit with the Fed or as vault cash and partly by drawing on other liquid assets that it holds for this purpose. Under normal conditions, new deposits approximately offset withdrawals, and the bank does not need to draw on its less liquid assets, such as loans and long-term securities, to cover withdrawals. If an unexpected wave of withdrawals occurs, however, the bank may use up all of its liquid assets. It will then have to convert some of its less liquid assets into cash. This may not be easy, especially if the wave of withdrawals takes place when business conditions are unfavorable, requiring the bank to sell the assets at less than the value at which they are entered on the bank's books. For example, a bank might have paid \$1,000,000 for bonds issued by a state government agency. Later, because of unfavorable market conditions, it might have to sell them for just \$800,000. Sales of assets at less than book value have an effect on the balance sheet similar to that of loan losses: In accordance with the basic equation of accounting, the reduction in the value of assets causes an equal reduction of the bank's net worth. If net worth falls below zero, the bank becomes insolvent.

Whether the bank's troubles begin with loan losses or with insufficient liquidity, there is a danger that they may trigger a run on the bank. A *run* is a situation in which depositors begin to withdraw their funds because they fear that the bank may become insolvent. Because large withdrawals force the bank to sell assets at less than their book values, depositors' fears become self-fulfilling and the bank fails.

In the worst possible case, the whole banking system, not just one bank, could get into trouble. If many banks faced loan losses or runs at the same time, they could not help one another with temporary loans of reserves. If large banks failed, smaller banks, which keep deposits in the large ones or make other loans to them, might be brought down, too. If many banks simultaneously tried to meet deposit outflows by selling their holdings of securities, the market price of the securities might fall, adding to their losses. A general bank *panic*, in which the stability of the whole system would be threatened, could ensue.

### ***Policies to Ensure Safety and Soundness***

During the nineteenth century, a number of bank panics were touched off by recessions. As a result, both state and federal governments experimented with policies designed to ensure the safety and soundness of the banking system. Out of these efforts has evolved a system that is based on three basic tools: bank supervision and regulation, loans to troubled banks, and deposit insurance.

## ***The U.S. Banking System***

**SUPERVISION AND REGULATION** Bank examinations are the oldest tool for ensuring the safety and soundness of the banking system. These examinations, conducted by state or federal officials, are intended to ensure that banks do not make unduly risky loans, that they value their assets honestly, and that they maintain an adequate level of net worth. Honest bookkeeping, prudent lending, and adequate net worth help banks to survive business downturns without becoming insolvent. A variety of federal and state agencies—including the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (part of the Treasury) or OCC for short—share responsibility for supervision and regulation.

Supervision and regulation do not always ensure sound banking practices. Examinations do not always spot bad loans. Sometimes examiners are deceived by fraudulent operators of banks and thrifts; in other cases they do no better than bank managers in spotting weak loans. In the case of thrifts, capital requirements were watered down by Congress and not enforced by regulators; many institutions were allowed to operate without an adequate cushion of net worth.

At the end of 1990, all banking regulatory agencies began phasing in so-called risk-based capital standards. Under these regulations, relatively risky assets require proportionately more capital as backing. This regulation has been introduced in compliance with an international agreement known as the Basel Accord, which is discussed further later in this chapter. More recent legislation at both the domestic and international level has tightened capital requirements still further.

**LENDER OF LAST RESORT** Bank inspections, introduced more than a century ago, were not by themselves enough to prevent banking panics. In 1907 an especially severe panic took place, eventually leading to the establishment of the Federal Reserve System in 1913. Among other duties, the Fed has the power to aid the banking system in times of trouble by acting as a lender of last resort. For example, when the stock market experienced a record 22.6 percent loss on October 19, 1987, the Fed quickly announced that it stood ready to lend extra funds to any banks that needed additional cash because of customers' stock market losses. As discussed in *Economics in the News 10.1*, the Fed played an essential role in maintaining the soundness of the U.S. banking system following the 9/11 terrorist attacks in 2001.

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### **Economics in the News 10.1**

#### **9/11: THE FED AS A LENDER OF LAST RESORT**

The September 11, 2001 attacks on the World Trade Center in New York and the Pentagon in Washington, D.C. caused severe disruptions in the financial system that left banks short on funds. The Fed's actions during the crisis highlight its importance not only as a lender of last resort, but as a central authority in the payments system.

At 11:45 A.M., just three hours after the attacks, the Federal Reserve issued the following press statement: “The Federal Reserve System is open and operating. The discount window is available to meet liquidity needs.” The discount window refers to a “window” where banks may go to take out loans from the Fed. Today, loan disbursements are made electronically through this “discount window.” In addition, the Federal Reserve’s staff contacted banks in the days surrounding the attacks to promote borrowing from the Fed as banks faced difficulty in honoring payments and extending lines of credit to their customers.

A series of events prevented timely payments both in the business and banking sectors. The physical damage to communications, computers, and general operations in New York slowed payments dramatically. The Federal Aviation Administration (FAA) halted air traffic, preventing the delivery of checks to banks by air. As a result, the volume of interbank transfers, essential in the bank payments system, fell 43% between September 10 and 11, 2001.

The Federal Reserve System responded by acting in its original role as a lender of last resort, providing large sums in the form of loans to the banking system. Between September 5 and September 12, Fed loans to banks increased from \$195 million to \$45.6 billion. As the president of the Federal Reserve Bank of St. Louis, William Poole, stated: “In the absence of Fed intervention, we would have seen a cascade of defaults as firms due funds that were not arriving would be unable to meet their obligations.”

Sources: Kristin Van Gaasbeck, “Circling the Wagons: The Fed’s Response to 9/11,” presented at the Western Economics Association International 78th Annual Meeting, Denver, CO, July 12, 2003; William Poole, “The Role of Government in U.S. Capital Markets,” lecture presented at the Institute of Governmental Affairs, University of California, Davis, October 18, 2001.

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Loans by the Fed to troubled institutions are useful primarily as a device to help fundamentally sound and solvent banks during temporary periods of insufficient liquidity. They cannot solve the problems of banks and thrifts that have fallen into insolvency because of imprudent management practices leading to massive loan losses.

**DEPOSIT INSURANCE** Even with its power as a lender of last resort, the Fed failed to prevent a major bank panic in 1933, during the Great Depression. In 1934, in response to that crisis, Congress established the Federal Deposit Insurance Corporation (FDIC). Since the Monetary Control Act of 1980, all deposits are insured up to \$100,000 per account (and even more in special cases.)

The idea of deposit insurance is to short-circuit runs on banks. If deposits are insured, depositors need not run to the bank to withdraw their funds; even if the bank fails, the government will pay them their money or arrange for the transfer of their deposits to a solvent bank. Also, if runs can be avoided, the problems of one or a few banks will not touch off a panic

that threatens the whole system. Depository institutions are supposed to bear the cost of deposit insurance through premiums charged by the insurance funds. However, in recent years, premiums have fallen short of costs and taxpayers have had to cover the insurance funds' losses.

One problem with deposit insurance is that it could encourage banks to take on excessive risk, since they know their depositors are insured by the government. The savings and loans (S&L) crisis of the 1980s offers a perfect example of this problem. Deposit insurance encouraged some banks and thrifts to take undue risks with their depositors' money; the depositors did not object, knowing that the federal government would bail them out if the institution failed. Losses at savings and loans associations were so large that the Federal Savings and Loan Insurance Corporation (FSLIC), the deposit insurance fund for S&L and mutual savings banks at the time, itself was forced into insolvency. Since 1989, the FDIC currently provides deposit insurance for S&Ls and mutual savings banks.

### ***International Banking***

Bank failures in one country have severe consequences for that country's trading partners. For this reason, in 1987 several countries attempted to establish a set of standard requirements for the international banking system. The resulting Basel Accord imposed regulations to help prevent banks from declaring bankruptcy. The Basel Accord guidelines also make recommendations regarding bank balance sheet management. In practice, the accord has been difficult to enforce because of varying accounting definitions and loopholes in the agreement.

As we saw for the U.S. banking system, safeguards are needed to prevent widespread bank failures. In the United States, this responsibility rests with the Fed, FDIC, and other regulators. Unfortunately, many countries do not have adequate resources to provide credible deposit insurance. While the FDIC regulates and examines the banks it insures, few insurance funds abroad have this power. Also, few central banks have enough funds to act as a lender of last resort in the case of a bank panic. For this reason, the International Monetary Fund (IMF) has assumed the role of a lender of last resort. Much like the Federal Reserve may approve loans to failing banks, the IMF provides loans to countries that do not have the necessary resources to finance bailouts, or even those unable to honor government debt obligations. However, it has been criticized for imposing requirements that are not in the best interest of countries relying on the IMF to borrow. For instance, the IMF was criticized for its handling of the East Asian financial crisis that involved Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand. As shown in *Economics in the News 10.2*, while Malaysia did not receive direct aid from the IMF, it fared better than other countries such as Korea and Indonesia that did receive IMF loans.

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## Economics in the News 10.2

### GLOBAL BANKING CRISES

The international banking system's stability has become increasingly important and increasingly difficult to maintain. Because each country has its own banking regulations, it is difficult to maintain international banking standards. The "International Banking" section below discusses a few examples of past international banking crises and of attempts to regulate the international banking system. The table below highlights recent international banking crises and reports the estimated losses attributed to bank failures. For each country, the cost as a share of the economy's Gross Domestic Product (GDP) is reported.

From the table, we see that the 1980s U.S. S&L crisis cost relatively little as a percentage of the economy's resources (GDP). Also, the table shows how devastating banking crises can be, illustrating the importance of adequate bank regulation.

#### Cost of International Banking Crises (1980–present)

Country	Dates	Estimated Cost as a % of GDP
Argentina	1980–82	55%
Indonesia	1997–present	50–55%
Thailand	1997–present	42%
Cote d'Ivoire	1988–1991	25%
Mexico	1995–present	15%
Japan	1990s	12%
Hungary	1991–1995	10%
Russia	1998–1999	5–7%
United States	1984–1991	3%
Turkey	1982–1985	2.5%
New Zealand	1987–1990	1%

Source: Daniela Klingebiel and Luc Laewan, eds., "Managing the Real and Fiscal Effects of Banking Crises," World Bank Discussion Paper No. 428 (Washington: World Bank, 2002).

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## SUMMARY

1. **What is money, and what does it do?** *Money* is an asset that serves as a means of payment, a store of purchasing power, and a unit of account. Because money can be used as a means of payment and has a fixed nominal value, it is said to be *liquid*.
2. **How is the stock of money in the economy measured?** A narrow measure of the money stock, *M1*, includes *currency* (coins and paper money) plus *transaction deposits* (deposits on which checks can be freely written). A broader and more widely used measure, *M2*, includes the components of *M1* plus money market mutual fund shares, money market deposit

accounts, *savings deposits*, small-denomination *time deposits*, and certain other liquid assets. The relationship between money and other economic variables can be stated as the *equation of exchange*:  $MV = Py$ , in which M stands for the money stock, V for *velocity*, P for the price level, and y for real domestic product.

- 3. What is the structure of the U.S. banking system?** The U.S. banking system consists of four types of *depository institutions*. The most important are *commercial banks*, which specialize in commercial loans and transaction deposits. In addition, there are three types of *thrift institutions*: savings and loan associations, savings banks, and credit unions. The Federal Reserve System is the nation's central bank. It provides services to depository institutions, holds much of their required *reserves*, and, together with other federal agencies, regulates the banking system.
- 4. How are the safety and stability of the banking system maintained?** Banks fail if they become insolvent—that is, if their assets fall below the level of their liabilities. This may happen because of loan losses or because deposit withdrawals have exhausted liquid assets. The government has three principal tools for ensuring the safety and soundness of the banking system: supervision and regulation; loans to banks and thrifts experiencing liquidity problems; and deposit insurance.

## KEY TERMS

Money

Liquidity

Currency

Transaction deposit

Commercial banks

Thrift institutions (thrifts)

Depository institutions

M1

Time deposit

Savings deposit

M2

Equation of exchange

Velocity (income  
velocity of money)

Balance sheet

Assets

Liabilities

Net worth

## PROBLEMS AND TOPICS FOR DISCUSSION

1. **Examining the lead-off case.** What characteristics of stone wheels make it possible for them to serve as money in the Yap economy? Why are other forms of money used for some transactions? Discuss.
2. **The functions of money.** Money serves three functions: as a means of payment, a store of purchasing power, and a unit of account. How does inflation undermine each of these functions?
3. **Barter in the modern economy.** For most purposes, money lowers the cost of making transactions relative to barter—the direct exchange of one good or service for another. However, barter has not disappeared, even in an advanced economy such as that of the United States. Can you give an example of the use of barter in the U.S. economy today? Why is barter used instead of money in this case?
4. **Plastic money.** Do you use any credit cards? Does their use reduce the amount of money you need? Which forms of money do you need less of because you have a credit card? How do credit cards differ from debit cards?
5. **The banking balance sheet.** The National Information Center is a database with banking information maintained by the Federal Reserve System. You can download balance sheet information at <http://www.ffiec.gov/nic/>. Do an institution search for your bank or thrift and download the balance sheet information for this institution. How does this balance sheet compare with that of all commercial banks as given in Table 10.2? *Bonus question:* Obtain the balance sheets of a bank and a thrift and compare them.
6. **Current monetary data.** Every Thursday the Federal Reserve reports certain key data on money and the banking system. These reports are available from the Board of Governors of the Federal Reserve System *H.6 Statistical Release*. Obtain the most recent H.6 release online at <http://www.federalreserve.gov/releases/> and answer the following questions:
  - a. What items are included in M2 that are not included in M1? What was the total of such items in the most recent month for which data are reported? Which of these money measures grew most quickly in the most recent month for which data are reported?
  - b. Demand and other transaction deposits at these banks account for about what percentage of M1? What percentage of M1 is held in the form of currency and travelers checks?
7. **Recent bank failures.** The FDIC maintains a list of recently failed banks online at <http://www.fdic.gov/bank/>. Go to this list and download the information for a recently

failed bank. Why did the institution fail? How did federal authorities respond to the failure?

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### **Case for Discussion**

#### **MAKESHIFT MONEY IN THE FRENCH COLONIAL PERIOD**

*The following letter was written by de Meulle, governor of the French province of Quebec in September 1685:*

My Lord—

I have found myself this year in great straits with regard to the subsistence of the soldiers. You did not provide for funds, My Lord, until January last. I have, notwithstanding, kept them in provisions until September, which makes eight full months. I have drawn from my own funds and from those of my friends, all I have been able to get, but at last finding them without means to render me further assistance, and not knowing to what saint to pay my vows, money being extremely scarce, having distributed considerable sums on every side for the pay of the soldiers, it occurred to me to issue, instead of money, notes on [playing] cards, which I have had cut in quarters. I send you My Lord, the three kinds, one is for four francs, another for forty sols, and the third for fifteen sols, because with these three kinds, I was able to make their exact pay for one month. I have issued an ordinance by which I have obliged all the inhabitants to receive this money in payments, and to give it circulation, at the same time pledging myself, in my own name, to redeem the said notes. No person has refused them, and so good has been the effect that by this means the troops have lived as usual. There were some merchants who, privately, had offered me money at the local rate on condition that I would repay them in money at the local rate in France, to which I could not consent as the King would have lost a third; that is, for 10,000 he would have paid 40,000 livres; thus personally, by my credit and by my management, I have saved His Majesty 13,000 livres.

[Signed] de Meulle

Quebec, 24th September, 1685

Source: From *Canadian Currency, Exchange and Finance During the French Period*, vol. 1, ed. Adam Shortt (New York: Burt Franklin, Research Source Works Series no. 235, 1968).

### **QUESTIONS**

1. What indication do you find that the playing-card notes issued by the governor served as a means of payment? Why were they accepted as such?
2. What indicates that the notes served as a store of value? What made them acceptable as such?
3. Did the invention of playing-card money change the unit of account in the local economy?

## END NOTES

1. Money market mutual funds, which compete with banks and thrifts for household savings, make every effort to make their services as convenient as those of their competitors. They provide statements, checkbooks, deposit slips, and so on that closely resemble those used by banks and thrifts. Technically, however, their liabilities are shares in the fund's portfolio of assets, not deposits. Therefore, money market mutual funds are not considered to be depository institutions. Only retail, or consumer, money market mutual funds are included in M2—those owned by corporations are not.
2. This can be demonstrated as follows: First, the right-hand side of the equation, the price level times real domestic product, can be replaced by  $y$ , standing for nominal domestic product. Next, both sides of the equation can be divided by  $M$  to give  $V = y/M$ .