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chapter fifteen

15

Money, Banks, and the Federal Reserve System

貨幣、銀行及聯邦準備系統

McDonald's Money Problems in Argentina

➤ The McDonald's Big Mac is one of the most widely available products in the world. McDonald's 30,000 restaurants in 119 countries serve 50 million customers per day. Although some McDonald's restaurants are owned by the firm, many are franchises. A *franchise* is a business with the legal right to sell a good or service in a particular area. When a firm uses franchises, local entrepreneurs are able to buy and run the stores in their area. As McDonald's began expanding to other countries in the late 1960s, it relied on the franchise system. Franchisees in other countries were able to adapt the restaurants to the tastes of local customers. For example, although all 200 McDonald's restaurants in Argentina offer Big Macs and French fries, they also offer gourmet coffees and other foods not available in the U.S. McDonald's restaurants.

In 2001, McDonald's restaurants in Argentina began to suffer from the macroeconomic problems plaguing that country. Argentina's woes centered on "money." Households and firms had begun to lose faith in the Argentine peso, the country's official money. They believed that the peso would rapidly lose its value, reducing their ability to buy goods and services. Many people converged on banks and tried to withdraw their money so they could either immediately buy goods and services or exchange Argentine pesos for U.S. dollars. To stop the outflow of money from the banking system, the government limited the amount of Argentine currency that could be withdrawn to $1,000 per account per month. This action further weakened the economy by reducing the funds households and firms had available to spend. In addition, banks became cautious about making loans, which in turn led to additional reductions in spending. An Argentine doctor was quoted as saying, "Now there's a lack of cash. . . . None of my patients can pay." Another person observed, "The chain of payments has been broken. There are millions of people forced to resort to bartering—an old sweater, anything, for goods just to survive." A cell phone dealer said, "These days, if customers want to pay us in tomatoes, I'll consider making a deal."

During the currency crisis, one Argentine province decided to issue



its own currency, which it called the *patacone*. Because the patacone was not part of Argentina's official currency, there were doubts as to how widely it would be accepted by local firms. McDonald's restaurants in the province decided to accept the new currency as payment for a meal they labeled the "Patacombo": two cheeseburgers, an order of French fries, and a soft drink.

Although the crisis in Argentina eventually passed, confidence in money remains vitally important. When you buy a DVD from a store, you get something of value. You give the store clerk dollar bills, or you might write a check with your name and the name of a bank on it or use a debit card linked to your checking account. These pieces of paper have no value in and of themselves. You and the DVD store owner consider them valuable because others consider them valuable. This confidence and trust are hallmarks of money.

Confidence and trust cannot be taken for granted. As this example from Argentina shows, when households and firms lose faith in an official money, it can harm trade and economic activity in an economy. *An Inside Look* on page 482 discusses how several Latin American countries have moved away from fixing the value of their currencies against the dollar.

Sources: Tony Smith, "Freeze Has Argentines Crying All the Way to the Bank," Associated Press, December 11, 2001, and Matt Moffett, "Unfunny Money," *Wall Street Journal*, August 21, 2001.

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

① Define money and discuss its four functions.

② Discuss the definitions of the money supply used in the United States today.

③ Explain how banks create checking account deposits.

④ Discuss the three policy tools the Federal Reserve uses to manage the money supply.

⑤ Explain the quantity theory of money and use it to explain how high rates of inflation occur.

讀完本章，你應該具有下列能力：

① 定義貨幣和討論它的四種功用。

② 討論貨幣供給今日在美國之定義。

③ 解釋銀行體系如何創造貨幣。

④ 討論聯鄰準備體系用來管理貨幣供給的三種政策工具。

⑤ 解釋貨幣數量理論及利用它來解釋高通貨膨脹率如何發生。

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➤ In this chapter, we will explore the role of money in the economy. We will see how the banking system creates money and what policy tools the Federal Reserve uses to manage the quantity of money. At the end of the chapter, we will explore the link between changes in the quantity of money and changes in the price level. What you learn in this chapter will serve as an important foundation to understanding monetary policy and fiscal policy, which we study in the next three chapters.

What Is Money and Why Do We Need It?

① LEARNING OBJECTIVE

Define money and discuss its four functions.

學習目標 ①

定義貨幣和討論它的四種功用。

Could an economy function without money? We know the answer to this is yes, because there are many historical examples of economies where people traded goods for other goods, rather than using money. For example, a family operating a farm on the American frontier during colonial times might trade a cow for a plow. Most economies, though, use money. What is money? The economic definition of **money** is any asset that people are generally willing to accept in exchange for goods and services or for payment of debts. Recall from Chapter 5 that an **asset** is anything of value owned by a person or a firm. There are many possible kinds of money: In West Africa, at one time cowrie shells served as money. During World War II, prisoners of war used cigarettes as money.

Money Assets that people are generally willing to accept in exchange for goods and services or for payment of debts.

貨幣 人們願意接受以用來交換商品及服務或作為支付工具的東西。

Asset Anything of value owned by a person or a firm.

資產 個人或廠商擁有的有價物質。

Barter and the Invention of Money

To understand the importance of money, let's consider further the situation in economies that do not use money. These economies, where goods and services are traded directly for other goods and services, are called *barter economies.* Barter economies have a major shortcoming. To illustrate this shortcoming, consider a farmer on the American frontier in colonial days. Suppose the farmer needs another cow and proposes to trade a spare plow to a neighbor for one of the neighbor's cows. If the neighbor does not want the plow, the trade will not happen. For a barter trade to take place between two people, each person must want what the other one has. Economists refer to this requirement as a *double coincidence of wants.* The farmer who wants the cow might eventually be able to obtain one if he first trades with some other neighbor for something the neighbor with the cow wants. However, it may take several trades before the farmer is ultimately able to trade for what the neighbor with the cow wants. Locating several trading partners and making several intermediate trades can take considerable time and energy.

The problems with barter provide an incentive to identify a product that most people will accept in exchange for what they have to trade. For example, in colonial times animal skins were very useful in making clothing. The first governor of Tennessee actually received a salary of 1,000 deerskins per year, and the secretary of the treasury received 450 otter skins per year. A good used as money that also has value independent of its use as money is called a **commodity money.** Historically, once a good became widely accepted as money, people who did not have an immediate use for it would be willing to accept it. A colonial farmer—or the governor of Tennessee—might not want a deerskin, but as long as he knew he could use the deerskin to buy other goods and services, he would be willing to accept it in exchange for what he had to sell.

Commodity money A good used as money that also has value independent of its use as money.

商品貨幣 除了作為貨幣之用外，還可作為他途使用的商品。

For hundreds of years, the cowrie shell, found on the shores of the Indian and Pacific Oceans, was widely used as money throughout Africa, Asia, and the islands of the South Pacific. The symbol representing the cowrie was adopted as the word for money in ancient China. Cowries continued to be used as money in remote areas of Asia and Africa until the mid-twentieth century.

Trading goods and services is much easier once money becomes available. People only need to sell what they have for money and then use the money to buy what they want. If the colonial family can find someone to buy their plow, they can use the money to buy the cow they want. The family with the cow will accept the money

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because they know they can use it to buy what they want. Families will be less likely to produce everything or nearly everything they need themselves and more likely to specialize.

Most people in modern economies are highly specialized. They do only one thing—work as a nurse, an accountant, or an engineer—and use the money they earn to buy everything else they need. As we discussed in Chapter 2, people become much more productive by specializing because they can pursue their *comparative advantage.* The high income levels in modern economies are based on the specialization that money makes possible. We can now answer the question, "Why do we need money?" *By making exchange easier, money allows for specialization and higher productivity.*

15-1 Making the Connection

Money in a World War II Prisoner-of-War Camp

R. A. Radford has described his experiences as a captured British soldier in a German prisoner-of-war camp during World War II. At first, the prisoners traded the goods they received in packages from the Red Cross or from relatives at home on a barter basis, but the usual inefficiencies of barter led the prisoners to begin using cigarettes as money. Cigarettes were included in the Red Cross packages. According to Radford, "Everyone, including non-smokers, was willing to sell for cigarettes, using them to buy at another time and place. Cigarettes became the normal currency." Even a labor market developed: "Laundrymen advertised at two cigarettes a garment. Battle-dress [uniform] was scrubbed and pressed and a pair of trousers lent for the interim period for twelve. . . . Odd tailoring and other jobs similarly had their prices."

Prisoners set up small businesses in the camp, using cigarettes for money: "There was a coffee stall owner who sold tea, coffee or cocoa at two cigarettes a cup, buying his raw materials at market prices and hiring labour to gather fuel and to stoke; he actually enjoyed the services of a chartered accountant at one stage." Even a restaurant was organized "where food and hot drinks were sold while a band . . . performed."

In January 1945, near the end of the war, the Red Cross ration of cigarettes was eliminated. Given that some of the prisoners were heavy smokers, most of the rest of the cigarette money disappeared from circulation—a disadvantage of this particular commodity money!—and the camp went back to barter trading until it was liberated by the U.S. 30th Infantry Division in April 1945.

Source: R. A. Radford, "The Economic Organization of a P.O.W. Camp," *Economica,* Vol. 12, November 1945, pp. 189–201.



二次大戰期間，香煙曾在某些戰俘營被當成貨幣使用。

The Functions of Money

Anything used as money—whether a deerskin, a cowrie seashell, or a dollar bill—should fulfill the following four functions:

- Medium of exchange
- Unit of account
- Store of value
- Standard of deferred payment

貨幣之功用：

任何用來當成貨幣之物品—不論是鹿皮、貝殼、或紙幣，應該具有下列四種功用：

- 交易媒介。
- 計算單位。
- 價值貯藏。
- 延遲支付之標準。

MEDIUM OF EXCHANGE Money serves as a medium of exchange when sellers are willing to accept it in exchange for goods or services. When the local supermarket accepts your $5 bill in exchange for bread and milk, the $5 bill is serving as a medium of exchange. To go back to our earlier example, with a medium of exchange, the farmer with the extra plow does not have to want a cow, and the farmer with the extra cow does not have to want a plow. Both can exchange their products for money and use the money to buy what they want. An economy is more efficient when a single good is recognized as a medium of exchange.

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UNIT OF ACCOUNT In a barter system, each good has many prices. A cow may be worth two plows, 20 bushels of wheat, or six axes. Using a good as a medium of exchange confers another benefit: It reduces the need to quote many different prices in trade. Instead of having to quote the price of a single good in terms of many other goods, each good has a single price quoted in terms of the medium of exchange. This function of money gives buyers and sellers a *unit of account,* a way of measuring value in the economy in terms of money. Because the U.S. economy uses dollars as money, each good has a price in terms of dollars.

STORE OF VALUE Money allows value to be stored easily: If you do not use all your accumulated dollars to buy goods and services today, you can hold the rest to use in the future. In fact, a fisherman and a farmer would be better off holding money rather than inventories of their perishable goods. The acceptability of money in future transactions depends on its not losing value over time. Money is not the only store of value. Any asset—shares of Google stock, Treasury bonds, real estate, or Renoir paintings, for example—represents a store of value. Indeed, financial assets offer an important benefit relative to holding money because they generally pay a higher rate of interest or offer the prospect of gains in value. Other assets also have advantages relative to money because they provide services. A house, for example, offers you a place to sleep.

Why, then, would you bother to hold any money? The answer has to do with *liquidity,* or the ease with which a given asset can be converted into the medium of exchange. When money is the medium of exchange, it is the most liquid asset. You incur costs when you exchange other assets for money. When you sell bonds or shares of stock to buy a car, for example, you pay a commission to your broker. If you have to sell your house on short notice to finance an unexpected major medical expense, you pay a commission to a real estate agent and probably have to accept a lower price to exchange the house for money quickly. To avoid such costs, people are willing to hold some of their wealth in the form of money, even though other assets offer a greater return as a store of value.

STANDARD OF DEFERRED PAYMENT Money is also useful because it can serve as a standard of deferred payment in borrowing and lending. Money can facilitate exchange at a *given point in time* by providing a medium of exchange and unit of account. It can facilitate exchange *over time* by providing a store of value and a standard of deferred payment. For example, a furniture maker may be willing to sell a chair to a boat builder now in exchange for money in the future.

How important is it that money be a reliable store of value and standard of deferred payment? People care about how much food, clothing, and other goods and services their dollars will buy. The value of money depends on its purchasing power, which refers to its ability to buy goods and services. Inflation causes a decline in purchasing power because rising prices cause a given amount of money to purchase fewer goods and services. With deflation, the value of money increases because prices are falling.

You have probably heard relatives or friends exclaim, "A dollar doesn't buy what it used to!" They really mean that the purchasing power of a dollar has fallen, that a given amount of money will buy a smaller quantity of the same goods and services in the economy than it once did.

What Can Serve as Money?

Having a medium of exchange helps to make transactions easier, allowing the economy to work more smoothly. The next logical question is this: What can serve as money? That is, which assets should be used as the medium of exchange? We saw earlier that an asset must, at a minimum, be generally accepted as payment to serve as money. In practical terms, however, it must be even more.

There are five criteria that make a good suitable to use as a medium of exchange:

1. The good must be *acceptable* to (that is, usable by) most traders.
2. It should be of *standardized quality* so that any two units are identical.

商品適合當交易媒介的五個要件：
1. 它必須是被大部分人接受之商品。
2. 它的品質標準化，因此任何兩單位的商品皆同質。

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3. It should be *durable* so that value is not lost by spoilage.
4. It should be *valuable* relative to its weight so that amounts large enough to be useful in trade can be easily transported.
5. The medium of exchange should be *divisible* because different goods are valued differently.

3. 它必須能夠持久，因此它的價值不會因腐壞而喪失。
4. 它必須是容易運送。
5. 它必須是可分的，因為不同商品之價值不同。

Dollar bills meet all these criteria. What determines the acceptability of dollar bills as a medium of exchange? Basically, it is through self-fulfilling expectations: You value something as money only if you believe that others will accept it from you as payment. A society's willingness to use green paper dollars as money makes them an acceptable medium of exchange. This property of acceptability is not unique to money. Your personal computer has the same keyboard organization of letters as other computer keyboards because manufacturers agreed on a standard layout. You learned to speak English because it is probably the language that most people around you speak.

COMMODITY MONEY Commodity money meets the criteria for a medium of exchange. Gold, for example, was a common form of money in the nineteenth century because it was a medium of exchange, a unit of account, a store of value, and a standard of deferred payment. But commodity money has a significant problem: Its value depends on its purity. Therefore, someone who wanted to cheat could mix impure metals with a precious metal. Unless traders trusted each other completely, they needed to check the weight and purity of the metal at each trade. In the Middle Ages, respected merchants, who were the predecessors of modern bankers, solved this problem by assaying metals and stamping them with a mark certifying weight and purity and earned a commission in the process. Unstamped (uncertified) commodity money was acceptable only at a discount. Another problem with using gold as money was that the money supply was difficult to control, because it depended partly on unpredictable discoveries of new gold fields.

FIAT MONEY It can be inefficient for an economy to rely on only gold or other precious metals for its money supply. What if you had to transport bars of gold to settle your transactions? Not only would doing so be difficult and costly, but you would also run the risk of being robbed. To get around this problem, private institutions or governments began to store gold and issue paper certificates that could be redeemed for gold. In modern economies, paper currency is generally issued by a *central bank,* which is an agency of the government, like the Federal Reserve in the United States, that regulates the money supply. Today, no government in the world issues paper currency that can be redeemed for gold. Paper currency has no value unless it is used as money and is therefore not a commodity money. Instead, paper currency is a **fiat money,** which has no value except as money. If paper currency has no value except as money, why do consumers and firms use it?

Fiat money Money, such as paper currency, that is authorized by a central bank or governmental body and that does not have to be exchanged by the central bank for gold or some other commodity money.

法定貨幣 由中央銀行或政府單位賦予法償地位之貨幣(如紙鈔)，中央銀行不必用黃金或其他商品貨幣來交換。

If you look at a the top of a U.S. dollar bill, you will see that it is actually a *Federal Reserve Note,* issued by the Federal Reserve, which is the central bank in the United States. Because U.S. dollars are fiat money, the Federal Reserve is not required to give you gold or silver for your dollar bills. Federal Reserve currency is *legal tender* in the United States, which means the federal government requires that it be accepted in payment of debts and requires that cash or checks denominated in dollars be used in payment of taxes. Despite being legal tender, without everyone's acceptance dollar bills would not be a good medium of exchange and could not serve as money. In practice, you, along with everyone else, agree to accept Federal Reserve currency as money. The key to this acceptance is that *households and firms have confidence that if they accept paper dollars in exchange for goods and services, the dollars will not lose much value during the time they hold them.* Without this confidence, dollar bills would not serve as a medium of exchange.

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15-2 Making the Connection

Money without a Government? The Strange Case of the Iraqi Dinar

The value of the Iraqi dinar was rising against the U.S. dollar. This result may not seem surprising. We saw in Chapter 14 that the exchange rate, or the value of one currency in exchange for another currency, fluctuates—but this was May 2003. The Iraqi government of Saddam Hussein had collapsed the month before, following an invasion by U.S. and British forces. No new Iraqi government had been formed yet, but Iraqi paper currency with pictures of Saddam on it continued to be used in Iraq for buying and selling.

U.S. officials in Iraq had expected that once the war was over and Saddam had been forced from power, the currency with his picture on it would lose all of its value. This result had seemed inevitable once the United States had begun paying Iraqi officials in U.S. dollars. However, many Iraqis continued to use the dinar because they were familiar with that currency. As one Iraqi put it, "People trust the dinar more than the dollar. It's Iraqi." In fact, for some weeks after the invasion, increasing demand for the dinar caused its value to rise against the dollar. In early April, when U.S. troops first entered Baghdad, it took about 4,000 dinar to buy one U.S. dollar. Six weeks later, in mid-May, it took only 1,500 dinar.

Eventually, a new Iraqi government was formed, and the government ordered that dinars with Saddam's picture be replaced by a new dinar. The new dinar was printed in factories around the world, and 27 Boeing 747s filled with paper dinars were flown to Baghdad. By January 2004, two billion paper dinars in varying denominations had been distributed to banks throughout Iraq and the old Saddam dinars disappeared from circulation. That dinars issued by Saddam's government actually increased in value for a period after his government had collapsed illustrates an important fact about money: *Anything can be used as money as long as people are willing to accept it in exchange for goods and services,* even paper currency issued by a government that no longer exists.



很多伊拉克人仍使用有海珊人像之貨幣，即使他已失去了勢力。

Sources: Edmund L. Andrews, "His Face Still Gives Fits as Saddam Dinar Soars," *New York Times,* May 18, 2003; Yaroslav Trofimov, "Saddam Hussein Is Scarce, but Not the Saddam Dinar," *Wall Street Journal,* April 24, 2003; and "A Tricky Operation," *Economist,* June 24, 2004.

② LEARNING OBJECTIVE

Discuss the definitions of the money supply used in the United States today.

學習目標 ②

討論貨幣供給今日在美國之定義。

How Do We Measure Money Today?

The definition of money as a medium of exchange depends on beliefs about whether others will use the medium in trade now and in the future. This definition offers guidance for measuring money in an economy. Interpreted literally, this definition says that money should include only those assets that obviously function as a medium of exchange: currency, checking account deposits, and traveler's checks. These assets can easily be used to buy goods and services, and thus act as a medium of exchange.

This strict interpretation is too narrow, however, as a measure of the money supply in the real world. Many other assets can be used as a medium of exchange, but they are not as liquid as a checking account deposit or cash. For example, you can convert your savings account at a bank to cash. Likewise, if you have an account at a brokerage firm, you can write checks against the value of the stocks and bonds the firm holds for you. Although these assets have restrictions on their use and there may be costs to converting them into cash, they can be considered part of the medium of exchange.

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Economists have developed several different definitions of the money supply. Each definition includes a different group of assets. The definitions range from narrow to broad and are based on how liquid the assets are. The most narrow measure of money is cash. Broader measures include other assets that can be easily converted to cash, such as your checking account or savings account. In the United States, the Federal Reserve has conducted several studies of the appropriate definition of money. The job of defining the money supply has become more difficult during the past two decades as innovation in financial markets and institutions has created new substitutes for the traditional measures of the medium of exchange. During the 1980s, the Fed changed its definitions of money in response to financial innovation. Outside the United States, other central banks use similar measures. Now we will look more closely at the Fed's definitions of the money supply.

M1: The Narrowest Definition of the Money Supply

Figure 15-1 illustrates the definitions of the money supply. The narrowest definition of the money supply is called **M1.** It includes:

1. all the paper money and coins that are in circulation—meaning what is not held by banks or the government.
2. the value of all checking account balances at banks.
3. the value of traveler's checks.

The sum of paper money and coins is called *currency.* The value of checking account balances is roughly equal to the value of currency. Holdings of traveler's checks are much smaller than currency, amounting to less than $8 billion in May 2005.

Although currency and checking account balances are roughly equal in value, checking account balances are used much more often than currency to make payments. More than 80 percent of all expenditures on goods and services are made with a check, rather than with currency. In fact, the total amount of currency in circulation—$715 billion in September 2005—is a misleading number. This amount is more than $2,300

M1 The narrowest definition of the money supply: The sum of currency in circulation, checking account balances in banks, and holdings of traveler's checks.

M1 最狹義之貨幣供給。它是流通中之通貨、銀行支票存款餘額及旅行支票之持有量的總和。

最狹義的貨幣供給是M1。它包括：
1. 所有流通中之紙鈔與硬幣——意指不在銀行或政府手中之部分。
2. 銀行支票存款帳戶之數值。
3. 旅行支票之數值。

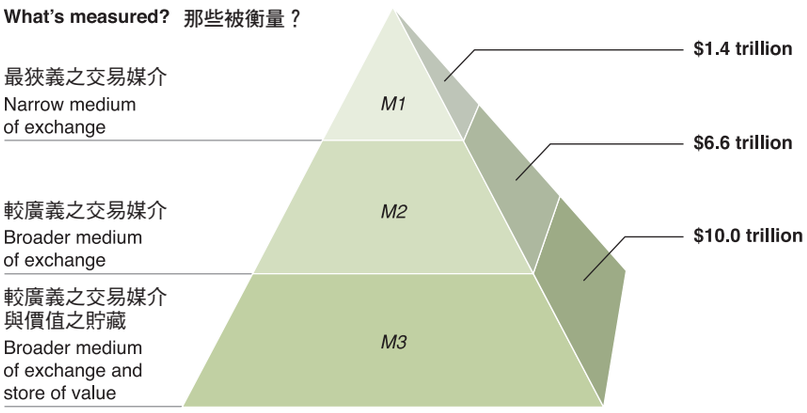

FIGURE 15-1

衡量貨幣供給（2005年9月）

聯邦準備使用很多不同貨幣供給之衡量在左圖之角錐，每種衡量包括該衡量以上資產，和額外之資產。

Source: Board of Governors of the Federal Reserve System, "Federal Reserve Statistical Release, H6," October 20, 2005.