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What Is Money?

Learning Objectives

- Describe what money is.
- List and summarize the functions of money.
- Identify different types of payment systems.
- Compare and contrast the M1 and M2 money supplies.

Preview

If you had lived in America before the Revolutionary War, your money might have consisted primarily of Spanish doubloons (silver coins that were also called *pieces of eight*). Before the Civil War, the principal forms of money in the United States were gold and silver coins and paper notes, called *banknotes*, issued by private banks. Today, you use as money not only coins and paper bills issued by the government, but also debit cards and checks written on accounts held at banks. Money has taken different forms at different times, but it has *always* been important to people and to the economy.

To understand the effects of money on the economy, we must understand exactly what money is. In this chapter, we develop precise definitions by exploring the functions of money, looking at why and how it promotes economic efficiency, tracing how its forms have evolved over time, and examining how money is currently measured.

MEANING OF MONEY

As used in everyday conversation, the word *money* can mean many things, but to economists it has a very specific meaning. To avoid confusion, we must clarify how economists' use of the word *money* differs from conventional usage.

Economists define *money* (also referred to as the *money supply*) as anything that is generally accepted as payment for goods or services or in the repayment of debts. Currency, consisting of paper bills and coins, clearly fits this definition and is one type of money. When most people talk about money, they're talking about **currency** (paper money and coins). If, for example, someone comes up to you and says, "Your money or your life," you should quickly hand over all of your currency rather than ask, "What exactly do you mean by 'money'?"

To define money merely as currency is much too narrow a definition for economists. Because checks are also accepted as payment for purchases, checking account deposits are considered money as well. An even broader definition of money is needed because other items, such as savings deposits, can, in effect, function as money if they can be quickly and easily converted into currency or checking account deposits. As you can see, no single, precise definition of money or the money supply is possible, even for economists.

To complicate matters further, the word *money* is frequently used synonymously with *wealth*. When people say, "Joe is rich—he has an awful lot of money," they probably

mean that Joe not only has a lot of currency and a high balance in his checking account but also has stocks, bonds, four cars, three houses, and a yacht. Thus, while “currency” is too narrow a definition of money, this other popular usage is much too broad. Economists make a distinction between money in the form of currency, demand deposits, and other items that are used to make purchases, and **wealth**, the total collection of pieces of property that serve to store value. Wealth includes not only money but also other assets such as bonds, common stock, art, land, furniture, cars, and houses.

People also use the word *money* to describe what economists call *income*, as in the sentence “Sheila would be a wonderful catch; she has a good job and earns a lot of money.” **Income** is a *flow* of earnings per unit of time. Money, by contrast, is a *stock*: It is a certain amount at a given point in time. If someone tells you that he has an income of \$1,000, you cannot tell whether he earns a lot or a little without knowing whether this \$1,000 is earned per year, per month, or even per day. But if someone tells you that she has \$1,000 in her pocket, you know exactly how much this is.

Keep in mind that the money discussed in this book refers to anything that is generally accepted as payment for goods and services or in the repayment of debts, and is distinct from income and wealth.

FUNCTIONS OF MONEY

Whether money is shells or rocks or gold or paper, it has three primary functions in any economy: as a medium of exchange, as a unit of account, and as a store of value. Of the three functions, its function as a medium of exchange is what distinguishes money from other assets such as stocks, bonds, and houses.

Medium of Exchange

In almost all market transactions in our economy, money in the form of currency or checks is a **medium of exchange**; it is used to pay for goods and services. The use of money as a medium of exchange promotes economic efficiency by minimizing the time spent in exchanging goods and services. To see why, let’s look at a *barter economy*, one without money, in which goods and services are exchanged directly for other goods and services.

Take the case of Ellen the Economics Professor, who can do just one thing well: give brilliant economics lectures. In a barter economy, if Ellen wants to eat, she must find a farmer who not only produces the food she likes but also wants to learn economics. As you might expect, this search will be difficult and time-consuming, and Ellen might spend more time looking for such an economics-hungry farmer than she will teaching. It is even possible that she will have to quit lecturing and go into farming herself. Even so, she may still starve to death.

The time spent trying to exchange goods or services is called a *transaction cost*. In a barter economy, transaction costs are high because people have to satisfy a “double coincidence of wants”—they have to find someone who has a good or service they want and who also wants the good or service they have to offer.

Let’s see what happens if we introduce money into Ellen the Economics Professor’s world. Ellen can teach anyone who is willing to pay money to hear her lecture. She can then go to any farmer (or his representative at the supermarket) and buy the food she needs with the money she has been paid. The problem of the double coincidence of

wants is avoided, and Ellen saves a lot of time, which she may spend doing what she does best: teaching.

As this example shows, money promotes economic efficiency by eliminating much of the time spent exchanging goods and services. It also promotes efficiency by allowing people to specialize in what they do best. Money is therefore essential in an economy: It is a lubricant that allows the economy to run more smoothly by lowering transaction costs, thereby encouraging specialization and division of labor.

The need for money is so strong that almost every society beyond the most primitive invents it. For a commodity to function effectively as money, it has to meet several criteria: (1) It must be easily standardized, making it simple to ascertain its value; (2) it must be widely accepted; (3) it must be divisible, so that it is easy to “make change”; (4) it must be easy to carry; and (5) it must not deteriorate quickly. Objects that have satisfied these criteria have taken many unusual forms throughout human history, ranging from wampum (strings of beads) used by Native Americans; to tobacco and whiskey, used by the early American colonists; to cigarettes, used in prisoner-of-war camps during World War II.¹ The diverse forms of money that have been developed over the years are as much a testament to the inventiveness of the human race as are the developments of tools and language.

Unit of Account

The second role of money is to provide a **unit of account**; that is, money is used to measure value in an economy. We measure the value of goods and services in terms of money, just as we measure weight in terms of pounds or distance in terms of miles. To see why this function is important, let’s look again at a barter economy, in which money does not perform this function. If the economy has only three goods—say, peaches, economics lectures, and movies—then we need to know only three prices to tell us how to exchange one for another: the price of peaches in terms of economics lectures (that is, how many economics lectures you have to pay for a peach), the price of peaches in terms of movies, and the price of economics lectures in terms of movies. If there were 10 goods, we would need to know 45 prices in order to exchange one good for another; with 100 goods, we would need 4,950 prices; and with 1,000 goods, we would need 499,500 prices.²

Imagine how hard it would be in a barter economy to shop at a supermarket with 1,000 different items on its shelves and be faced with deciding whether chicken or fish is a better buy if the price of a pound of chicken were quoted as 4 pounds of butter and the price of a pound of fish as 8 pounds of tomatoes. To make it possible to compare prices, the tag on each item would have to list up to 999 different prices, and the time spent reading them would result in very high transaction costs.

¹An extremely entertaining article on the development of money in a prisoner-of-war camp during World War II is R. A. Radford, “The Economic Organization of a P.O.W. Camp,” *Economica* 12 (November 1945): 189–201.

²The formula for telling us the number of prices we need when we have N goods is the same formula that tells us the number of pairs when there are N items. It is

$$\frac{N(N - 1)}{2}$$

In the case of ten goods, for example, we would need

$$\frac{10(10 - 1)}{2} = \frac{90}{2} = 45 \text{ prices.}$$

The solution to the problem is to introduce money into the economy and have all prices quoted in terms of units of that money, enabling us to quote the price of economics lectures, peaches, and movies in terms of, say, dollars. If there were only three goods in the economy, this would not be a great advantage over the barter system, because we would still need three prices to conduct transactions. But for 10 goods we would need only 10 prices; for 100 goods, 100 prices; and so on. At the 1,000-goods supermarket, now only 1,000 prices need to be considered, not 499,500!

We can see that using money as a unit of account lowers transaction costs in an economy by reducing the number of prices that need to be considered. The benefits of this function of money grow as the economy becomes more complex.

Store of Value

Money also functions as a **store of value**; it is a repository of purchasing power available over time. A store of value is used to save purchasing power from the time income is received until the time it is spent. This function of money is useful because most of us do not want to spend our income immediately upon receiving it, but rather prefer to wait until we have the time or the desire to shop.

Money is not unique as a store of value; any asset—whether money, stocks, bonds, land, houses, art, or jewelry—can be used to store wealth. Many such assets have advantages over money as a store of value: They often pay the owner a higher interest rate than money, experience price appreciation, and deliver services such as providing a roof over one's head. If these assets are a more desirable store of value than money, why do people hold money at all?

The answer to this question relates to the important economic concept of **liquidity**, the relative ease and speed with which an asset can be converted into a medium of exchange. Liquidity is highly desirable. Money is the most liquid asset of all because it is the medium of exchange; it does not have to be converted into anything else to make purchases. Other assets involve transaction costs when they are converted into money. When you sell your house, for example, you have to pay a brokerage commission (usually 4–6% of the sales price), and if you need cash immediately to pay some pressing bills, you might have to settle for a lower price if you want to sell the house quickly. Because money is the most liquid asset, people are willing to hold it even if it is not the most attractive store of value.

How good a store of value money is depends on the price level. A doubling of all prices, for example, means that the value of money has dropped by half; conversely, a halving of all prices means that the value of money has doubled. During times of inflation, when the price level is increasing rapidly, money loses value rapidly, and people become more reluctant to hold their wealth in this form. This is especially true during periods of extreme inflation, known as **hyperinflation**, in which the inflation rate exceeds 50% per month.

Hyperinflation occurred in Germany after World War I, with inflation rates sometimes exceeding 1,000% per month. By the end of the hyperinflation of 1923, the price level had risen to more than 30 billion times what it had been just two years before. The quantity of money needed to purchase even the most basic items became excessive. There are stories, for example, that near the end of the hyperinflation, a wheelbarrow of cash would be required to pay for a loaf of bread. Money was losing its value so rapidly that workers were paid and then given time off on several occasions during the day to spend their wages before the money became worthless. No one wanted to hold on to money, so the use of money to carry out transactions declined, and barter became more and more dominant. Transaction costs skyrocketed and, as we would expect, output in the economy fell sharply.

EVOLUTION OF THE PAYMENTS SYSTEM

We can obtain a better picture of the functions of money and the forms it has taken over time by looking at the evolution of the **payments system**, the method of conducting transactions in the economy. The payments system has been evolving over centuries, and with it the form of money. At one point, precious metals such as gold were used as the principal means of payment and were the main form of money. Later, paper assets such as checks and currency began to be used in the payments system and viewed as money. Where the payments system is heading has an important bearing on how money will be defined in the future.

Commodity Money

To obtain perspective on where the payments system is heading, it's worth exploring how it has evolved. For any object to function as money, it must be universally acceptable; everyone must be willing to take it in payment for goods and services. An object that clearly has value to everyone is a likely candidate to serve as money, and a natural choice is a precious metal such as gold or silver. Money made up of precious metals or another valuable commodity is called **commodity money**, and from ancient times until several hundred years ago, commodity money functioned as the medium of exchange in all but the most primitive societies. The problem with a payments system based exclusively on precious metals is that such a form of money is very heavy and is hard to transport from one place to another. Imagine the holes you'd wear in your pockets if you had to buy things only with coins! Indeed, for a large purchase such as a house, you'd have to rent a truck to transport the money payment.

Fiat Money

The next development in the payments system was *paper currency* (pieces of paper that function as a medium of exchange). Initially, paper currency carried a guarantee that it was convertible into coins or into a fixed quantity of precious metal. However, currency has evolved into **fiat money**, paper currency decreed by governments as legal tender (meaning that it must be accepted as legal payment for debts) but not convertible into coins or precious metal. Paper currency has the advantage of being much lighter than coins or precious metal, but it can be accepted as a medium of exchange only if there is some trust in the authorities who issue it and if printing has reached a sufficiently advanced stage that counterfeiting is extremely difficult. Because paper currency has evolved into a legal arrangement, countries can change the currency they use at will. Indeed, this is what many European countries did when they abandoned their currencies for the euro in 2002.

Major drawbacks of paper currency and coins are that they are easily stolen and can be expensive to transport in large amounts because of their bulk. To combat this problem, another step in the evolution of the payments system occurred with the development of modern banking: the invention of *checks*.

Checks

A check is an instruction from you to your bank to transfer money from your account to someone else's account when she deposits the check. Checks allow transactions to take place without the need to carry around large amounts of currency. The introduction of checks was a major innovation that improved the efficiency of the payments system. Frequently, payments made back and forth cancel each other; without checks, this

would involve the movement of a lot of currency. With checks, payments that cancel each other can be settled by canceling the checks, and no currency need be moved. The use of checks thus reduces the transportation costs associated with the payments system and improves economic efficiency. Another advantage of checks is that they can be written for any amount up to the balance in the account, making transactions for large amounts much easier. Checks are also advantageous in that loss from theft is greatly reduced and because they provide convenient receipts for purchases.

Two problems arise, however, with a payments system based on checks. First, it takes time to get checks from one place to another, a particularly serious problem if you are paying someone in a different location who needs to be paid quickly. In addition, if you have a checking account, you know that it often takes several business days before a bank will allow you to make use of the funds from a check you have deposited. If your need for cash is urgent, this feature of paying by check can be frustrating. Second, the paper shuffling required to process checks is costly; currently, the cost of processing all checks written in the United States is estimated at over \$10 billion per year.

Electronic Payment

The development of inexpensive computers and the spread of the Internet now make it cheap to pay bills electronically. In the past, you had to pay a bill by mailing a check, but now banks provide websites at which you just log on, make a few clicks, and thereby transmit your payment electronically. Not only do you save the cost of the stamp, but paying bills becomes (almost) a pleasure, requiring little effort. Electronic payment systems provided by banks now even spare you the step of logging on to pay the bill. Instead, recurring bills can be automatically deducted from your bank account. Estimated cost savings when a bill is paid electronically rather than by a check exceed one dollar per transaction. Electronic payment is thus becoming more and more common in the United States.

E-Money

Electronic payments technology can substitute not only for checks but also for cash, in the form of **electronic money** (or **e-money**)—money that exists only in electronic form. The first form of e-money was the *debit card*. Debit cards, which look like credit cards, enable consumers to purchase goods and services by electronically transferring funds directly from their bank accounts to a merchant's account. Debit cards are used in many of the same places that accept credit cards and are now often faster to use than cash. At most supermarkets, for example, you can swipe your debit card through the card reader at the checkout station, press a button, and the amount of your purchase is deducted from your bank account. Most banks, as well as companies such as Visa and MasterCard, issue debit cards, and your ATM card typically can function as a debit card.

A more advanced form of e-money is the *stored-value card*. The simplest form of stored-value card is purchased for a preset dollar amount that the consumer pays up front, like a prepaid phone card. The more sophisticated stored-value card is known as a **smart card**. It contains a computer chip that allows it to be loaded with digital cash from the owner's bank account whenever needed. In Asian countries, such as Japan and Korea, cell phones now have a smart card feature that raises the expression "pay by phone" to a new level. Smart cards can be loaded from ATM machines, personal computers with a smart card reader, or specially equipped telephones.

A third form of electronic money, often referred to as **e-cash**, is used on the Internet to purchase goods or services. A consumer gets e-cash by setting up an account with

FYI Are We Headed for a Cashless Society?

Predictions of a cashless society have been around for decades, but they have not come to fruition. For example, *Business Week* predicted in 1975 that electronic means of payment “would soon revolutionize the very concept of money itself,” only to reverse its view several years later. In recent years, pilot projects aimed at converting consumers to the use of e-money in the form of smart cards have not been a success. Mondex, which was launched in Great Britain in 1995 and was one of the first widely-touted stored-value cards, is now used only on a few British university campuses. In Germany and Belgium, millions of people carry bank cards with computer chips embedded in them that enable them to make use of e-money, but very few people actually use them. Why has the movement to a cashless society been so slow in coming?

Although e-money might be more convenient and efficient than a payments system based on paper, several factors work against the disappearance of the paper system. First, it is very expensive to set up the computer, card reader, and telecommunications networks necessary to make electronic money the

dominant form of payment. Second, electronic means of payment raise security and privacy concerns. We often hear media reports of an unauthorized hacker who has been able to access a computer database and alter the information stored there. Because this is not an uncommon occurrence, unscrupulous persons might be able to access bank accounts in electronic payments systems and steal funds by moving them from someone else’s accounts into their own. The prevention of this type of fraud is no easy task, and a whole new field of computer science has developed to cope with such security issues. A further concern is that the use of electronic means of payment leaves an electronic trail that contains a large amount of personal data on buying habits. There are worries that government agencies, employers, and marketers might be able to access these data, thereby enabling them to encroach on our privacy if they choose to do so.

In conclusion, although the use of e-money will surely increase in the future, to paraphrase Mark Twain, “the reports of cash’s death are greatly exaggerated.”

a bank that has links to the Internet and then transferring the e-cash to her PC. When she wants to buy something with e-cash, she surfs to a store on the Web and clicks the “buy” option for a particular item, whereupon the e-cash is automatically transferred from her computer to the merchant’s computer. The merchant can then have the funds transferred from the consumer’s bank account to his own before the goods are shipped.

Given the convenience of e-money, you might think that we would move quickly to a cashless society in which all payments are made electronically. However, this hasn’t happened, as discussed in the FYI box, “Are We Headed for a Cashless Society?”

APPLICATION Will Bitcoin Become the Money of the Future?

Bitcoin is a new type of electronic money created by software developer Satoshi Nakamoto in 2009. Bitcoin is not controlled by a single entity like a central bank, but rather is created in a decentralized fashion by users who generate new bitcoins when they use their computing power to verify and process Bitcoin transactions, a process referred to as “mining.” Some tech enthusiasts have characterized Bitcoin as the money of the future. But does Bitcoin satisfy the three key functions of money that we discussed earlier? That is, does it function as a medium of exchange, a unit of account, and a store of value?

Bitcoin certainly functions well as a medium of exchange. It has two features that make it attractive for conducting transactions. First, the fees for conducting transactions with bitcoins are substantially lower than those associated with credit cards and debit cards. Second, transactions made with bitcoins can be made anonymously, which is very attractive to those who want to preserve their privacy.

Bitcoin, however, does not do well with regard to the other two functions of money—as a unit of account and a store of value. The price of Bitcoin has been extremely volatile, with its volatility estimated to be over seven times that of the price of gold and over eight times that of stock market indexes such as the S&P 500. For example, in 2011, the price of a bitcoin fluctuated between 30 cents and \$32. It then rose to a peak of \$255 on April 10, 2013, only to fall back down to \$55 on April 17. On November 30, 2013, the price of a bitcoin peaked at \$1125, but it then fell to below the \$500 level by May of 2014.

The high volatility of the value of the bitcoin means that it does not function well as a store of value; it is just too risky. Because of this volatility, the Bitcoin has not become a unit of account: Almost no one quotes the prices of their products in terms of bitcoins.

Despite the hype, Bitcoin does not satisfy two of the three key functions of money and thus its use as money is likely to be quite limited. Furthermore, governments are concerned about the use of Bitcoin to conduct drug transactions and money laundering. The Department of Homeland Security seized Bitcoin assets from the Mt. Gox exchange when the FBI shut down the Silk Road drug website in May of 2013. Countries such as China have outlawed the use of Bitcoin as a currency. There also have been high-profile thefts of Bitcoin, with Mt. Gox, one of the largest Bitcoin exchanges, experiencing a theft of almost \$500 million worth of Bitcoin in February of 2014, leading Mt. Gox to file for bankruptcy.

Our understanding of the functions of money strongly suggests that Bitcoin will not be the money of the future. However, some of its technology, which enables users to conduct electronic transactions cheaply, may become a feature of future electronic payments systems. ♦

MEASURING MONEY

The definition of money as anything that is generally accepted as payment for goods and services tells us that money is defined by people's behavior. An asset is considered money only if people believe it will be accepted by others when making payment. As we have seen, many different assets have performed this role over the centuries, ranging from gold to paper currency to checking accounts. For this reason, a behavioral definition does not tell us which assets in our economy should be considered money. To measure money, we need a precise definition that tells us exactly which assets should be included.

The Federal Reserve's Monetary Aggregates

The Federal Reserve System (the Fed), the central banking authority responsible for monetary policy in the United States, has conducted many studies on how to measure money. The problem of measuring money has recently become especially crucial because extensive financial innovation has produced new types of assets that might properly belong in a measure of money. Since 1980, the Fed has modified its measures of money several times and has settled on the following measures of the money supply, which are also referred to as **monetary aggregates** (see Table 1 and the Following the Financial News box).

The narrowest measure of money reported by the Fed is **M1**, which includes the most liquid assets: currency, checking account deposits, and traveler's checks. The

TABLE 1 Measures of the Monetary Aggregates

	Value as of August 18, 2014, (\$ billions)
M1 = Currency	1,206.1
+ Traveler's checks	3.3
+ Demand deposits	1,089.9
+ Other checkable deposits	<u>477.4</u>
Total M1	2,776.7
M2 = M1	
+ Small-denomination time deposits	533.0
+ Savings deposits and money market deposit accounts	7,338.2
+ Money market mutual fund shares (retail)	<u>642.5</u>
Total M2	11,290.4

Source: <http://www.federalreserve.gov/releases/h6/hist>.

components of M1 are shown in Table 1. The *currency* component of M1 includes only paper money and coins in the hands of the nonbank public and does not include cash held in ATMs or bank vaults. Surprisingly, more than \$4,000 cash is in circulation for each person in the United States (see the FYI box). The *traveler's checks* component of M1 includes only traveler's checks not issued by banks. The *demand deposits* component includes business checking accounts that do not pay interest, as well as traveler's checks issued by banks. The *other checkable deposits* item includes all other checkable deposits, particularly interest-bearing checking accounts held by households. These assets are clearly money because they can be used directly as a medium of exchange.

Until the mid-1970s, only commercial banks were permitted to establish checking accounts, and they were not allowed to pay interest on them. With the advent of financial innovation (discussed more extensively in Chapter 11), regulations have changed so that other types of banks, such as savings and loan associations, mutual savings banks, and credit unions, can also offer checking accounts. In addition, banking institutions can offer other checkable deposits, such as NOW (negotiated order of withdrawal) accounts and ATS (automatic transfer from savings) accounts, that do pay interest on their balances.

Following the Financial News The Monetary Aggregates

Every week on Thursday, the Federal Reserve publishes the data for M1 and M2 in its H.6 release. These numbers are often reported on in the media. The H.6 release

can be found at <http://www.federalreserve.gov/releases/h6/current/h6.htm>.

FYI Where Are All the U.S. Dollars?

The almost \$4,000 of U.S. currency held per person in the United States is a surprisingly large number. U.S. currency is bulky, can be easily stolen, and pays no interest, so it doesn't make sense for most of us to keep a lot of it. Do you know anyone who carries \$4,000 in his or her pockets? We have a puzzle: Where are all these dollars, and who is holding them?

Criminals are one group that holds a lot of dollars. If you were engaged in illegal activity, you would not conduct your transactions with checks because they are traceable and therefore a potentially powerful piece of evidence against you. That explains why gangsters like Tony Soprano have so much cash buried in their

backyards. Some businesses like to retain a lot of cash because, if they operate as a cash business, it makes their transactions less traceable; thus they can avoid declaring income on which they would otherwise have to pay taxes.

Foreigners are the other group that routinely holds U.S. dollars. In many countries, people do not trust their own currency because their country often experiences high inflation, which erodes the value of that currency; these people hold U.S. dollars as a hedge against this inflation risk. Lack of trust in the ruble, for example, has led Russians to hoard enormous amounts of U.S. dollars. More than half of U.S. dollars are held abroad.

The **M2** monetary aggregate adds to M1 other assets that are not quite as liquid as those included in M1: assets that have check-writing features (money market deposit accounts and money market mutual fund shares) and other assets (savings deposits and small-denomination time deposits) that can be turned into cash quickly and at very little cost. *Small-denomination time deposits* are certificates of deposit with a denomination of less than \$100,000 that can be redeemed without a penalty only at a fixed maturity date. *Savings deposits* are nontransaction deposits that can be added to or taken out at any time. *Money market deposit accounts* are similar to money market mutual funds but are issued by banks. The *money market mutual fund shares* are retail accounts on which households can write checks.

Because economists and policymakers cannot be sure which of the monetary aggregates is the best measure of money, it is logical to wonder if the movements of M1 and M2 closely parallel one another. If they do, then using one monetary aggregate to predict future economic performance and to conduct policy will be the same as using the other, and it does not much matter that we are not sure of the appropriate definition of money for a given policy decision. However, if the monetary aggregates do *not* move together, then what one monetary aggregate tells us is happening to the money supply might be quite different from what the other monetary aggregate would tell us. Conflicting information would present a confusing picture, making it hard for policymakers to decide on the right course of action.

Figure 1 plots the growth rates of M1 and M2 from 1960 to 2014. The growth rates of these two monetary aggregates do tend to move together; the timing of their rise and fall is roughly similar until the 1990s, and they both show a higher growth rate, on average, in the 1970s than in the 1960s.

Yet some glaring discrepancies exist between the movements of these aggregates. Contrast M1's high rates of growth from 1992 to 1994 with the much lower growth rates of M2. Also notice that from 2004 to 2007, M2's growth rate increased slightly, while M1's growth rate decelerated sharply and became negative. In 2009 and 2011, M1 growth surged to over 15% from near zero the year before, while M2 growth rose

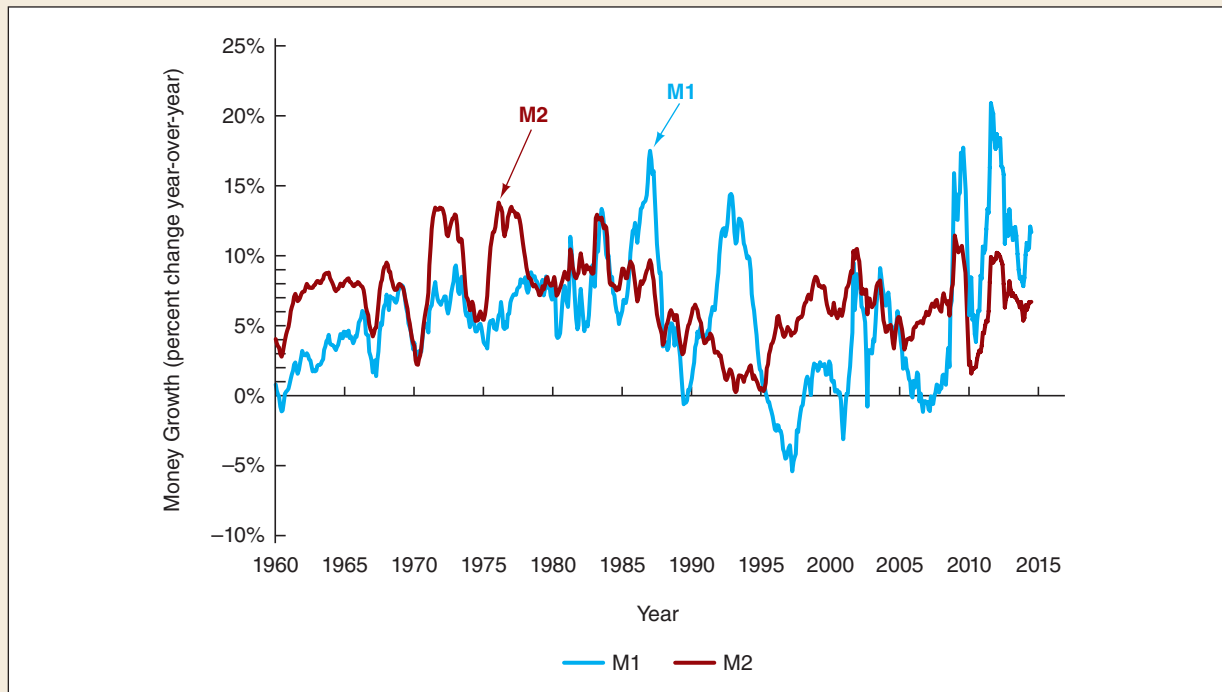


FIGURE 1 Growth Rates of the M1 and M2 Aggregates, 1960–2014

The timing of the rise and fall of growth rates is roughly similar for both M1 and M2. There were periods, however, such as 1992–1994 and 2004–2007, during which M1 and M2 moved in opposite directions, leading to conflicting recommendations about the best course of monetary policy.

Source: Federal Reserve Bank of St. Louis, FRED database: <http://research.stlouisfed.org/fred2/>

less dramatically. Thus, the different measures of money tell a very different story about the results of monetary policy in recent years.

From the data in Figure 1, you can see that obtaining a single, precise, and correct measure of money does seem to matter, and that it does make a difference which monetary aggregate policymakers and economists choose as the best measure of money.

SUMMARY

1. To economists, the word *money* has a different meaning than *income* or *wealth*. Money is anything that is generally accepted as payment for goods or services or in the repayment of debts.
2. Money serves three primary functions: as a medium of exchange, as a unit of account, and as a store of value. Money as a medium of exchange helps an economy avoid the problem of double coincidence of wants that arises in a barter economy, and thus lowers transaction costs and

encourages specialization and the division of labor. Money as a unit of account reduces the number of prices needed in an economy, which also reduces transaction costs. Money also functions as a store of value, but performs this role poorly if it is rapidly losing value due to inflation.

3. The payments system has evolved over time. Until several hundred years ago, the payments systems in all but the most primitive societies were based primarily on precious metals. The introduction of paper currency lowered the

cost of transporting money. The next major advance was the introduction of checks, which lowered transaction costs still further. We are currently moving toward an electronic payments system in which paper is eliminated and all transactions are handled by computers. Despite the potential efficiency of such a system, obstacles are slowing the movement to a checkless society and the development of new forms of electronic money.

4. The Federal Reserve System has defined two different measures of the money supply—M1 and M2. These measures are not equivalent and do not always move together, so they cannot be used interchangeably by policymakers. Obtaining the precise, correct measure of money does seem to matter and has implications for the conduct of monetary policy.

KEY TERMS

commodity money, p. 99	income, p. 96	payments system, p. 99
currency, p. 95	liquidity, p. 98	smart card, p. 100
e-cash, p. 100	M1, p. 102	store of value, p. 98
electronic money (e-money), p. 100	M2, p. 104	unit of account, p. 97
fiat money, p. 99	medium of exchange, p. 96	wealth, p. 96
hyperinflation, p. 98	monetary aggregates, p. 102	

QUESTIONS

Select questions are available in **MyEconLab** at <http://www.myeconlab.com>.

1. Why is simply counting currency an inadequate measure of money?
2. In prison, cigarettes are sometimes used among inmates as a form of payment. How is it possible for cigarettes to solve the “double coincidence of wants” problem, even if a prisoner does not smoke?
3. Three goods are produced in an economy by three individuals:

<i>Good</i>	<i>Producer</i>
Apples	Orchard owner
Bananas	Banana grower
Chocolate	Chocolatier

If the orchard owner likes only bananas, the banana grower likes only chocolate, and the chocolatier likes only apples, will any trade between these three persons take place in a barter economy? How will introducing money into the economy benefit these three producers?

4. Why did cavemen not need money?
5. Most of the time it is quite difficult to separate the three functions of money. Money performs its three functions at all times, but sometimes we can stress one

in particular. For each of the following situations, identify which function of money is emphasized.

- a. Brooke accepts money in exchange for performing her daily tasks at her office, since she knows she can use that money to buy goods and services.
- b. Tim wants to calculate the relative value of oranges and apples, and therefore checks the price per pound of each of these goods as quoted in currency units.
- c. Maria is currently pregnant. She expects her expenditures to increase in the future and decides to increase the balance in her savings account.
6. In Brazil, a country that underwent a rapid inflation before 1994, many transactions were conducted in dollars rather than in reals, the domestic currency. Why?
7. Was money a better store of value in the United States in the 1950s than in the 1970s? Why or why not? In which period would you have been more willing to hold money?
8. Why have some economists described money during a hyperinflation as a “hot potato” that is quickly passed from one person to another?
9. Why were people in the United States in the nineteenth century sometimes willing to be paid by check rather than with gold, even though they knew there was a possibility that the check might bounce?

10. In ancient Greece, why was gold a more likely candidate for use as money than wine?
11. If you use an online payment system such as PayPal to purchase goods or services on the Internet, does this affect the M1 money supply, the M2 money supply, both, or neither? Explain.
12. Rank the following assets from most liquid to least liquid:
 - a. Checking account deposits
 - b. Houses
 - c. Currency
 - d. Automobiles
 - e. Savings deposits
 - f. Common stock
13. Which of the Federal Reserve's measures of the monetary aggregates—M1 or M2—is composed of the most liquid assets? Which is the larger measure?
14. It is not unusual to find a business that displays a sign saying "no personal checks, please." On the basis of this observation, comment on the relative degree of liquidity of a checking account versus currency.
15. For each of the following assets, indicate which of the monetary aggregates (M1 and M2) includes them:
 - a. Currency
 - b. Money market mutual funds
 - c. Small-denomination time deposits
 - d. Checkable deposits
16. Assume that you are interested in earning some return on the idle balances you usually keep in your checking account and decide to buy some money market mutual funds shares by writing a check. Comment on the effect of your action (with everything else the same) on M1 and M2.
17. In April 2009, the growth rate of M1 fell to 6.1%, while the growth rate of M2 rose to 10.3%. In September 2013, the year-over-year growth rate of the M1 money supply was 6.5%, while the growth rate of the M2 money supply was about 8.3%. How should Federal Reserve policymakers interpret these changes in the growth rates of M1 and M2?
18. Suppose a researcher discovers that a measure of the total amount of debt in the U.S. economy over the past twenty years was a better predictor of inflation and the business cycle than M1 or M2. Does this discovery mean that we should define money as equal to the total amount of debt in the economy?

APPLIED PROBLEMS

Select applied problems are available in MyEconLab at <http://www.myeconlab.com>.

19. The table below shows hypothetical values, in billions of dollars, of different forms of money.
 - a. Use the table to calculate the M1 and M2 money supplies for each year, as well as the growth rates of the M1 and M2 money supplies from the previous year.
 - b. Why are the growth rates of M1 and M2 so different? Explain.

	2009	2010	2011	2012
A. Currency	950	960	962	967
B. Money market mutual fund shares	677	678	676	685
C. Saving account deposits	5,600	5,880	6,068	6,205
D. Money market deposit accounts	1,200	1,231	1,260	1,315
E. Demand and checkable deposits	1,010	982	990	1,003
F. Small-denomination time deposits	830	861	1,123	1,566
G. Traveler's checks	4	4	3	2
H. 3-month Treasury bills	1,996	2,384	2,446	2,512

DATA ANALYSIS PROBLEMS

The Problems update with real-time data in **MyEconLab** and are available for practice or instructor assignment.

1. Go to the St. Louis Federal Reserve FRED database, and find data on currency (CURRSL), traveler's checks (TVCKSSL), demand deposits (DEMDEPSL), and other checkable deposits (OCDSL). Calculate the M1 money supply, and calculate the percentage change in M1 and in each of the four components of M1 from the most recent month of data available to the same time one year prior. Which component has the highest growth rate? The lowest growth rate? Repeat the calculations using the data from January 2000 to the most recent month of data available, and compare your results.
2. Go to the St. Louis Federal Reserve FRED database, and find data on small-denomination time deposits (STDSSL), savings deposits and money market deposit accounts (SAVINGSL), and retail money market funds (RMFSL). Calculate the percentage change of each of these three components of M2 (not included in M1) from the most recent month of data available to the same time one year prior. Which component has the highest growth rate? The lowest growth rate? Repeat the calculations using the data from January 2000 to the most recent month of data available, and compare your results. Use your answers from question 1 to determine which grew faster: the non-M1 components of M2, or the M1 money supply.

WEB EXERCISES

1. Go to <http://www.federalreserve.gov/releases/h6/Current/>.
 - a. What have been the growth rates of M1 and M2 over the past twelve months?
 - b. From what you know about the state of the economy, do these growth rates seem expansionary or restrictive?

WEB REFERENCES

<http://www.federalreserve.gov/paymentsystems/default.htm>

This site reports on the Federal Reserve's policies regarding payments systems.

<http://www.federalreserve.gov/releases/h6/Current/>

The Federal Reserve reports the current levels of M1 and M2 on this website.

PART

2

Financial Markets

Crisis and Response: Credit Market Turmoil and the Stock Market Crash of October 2008

The financial crisis that started during the summer of 2007 began to snowball as the value of mortgage-backed securities on financial institutions' balance sheets plummeted. When the House of Representatives, fearing the wrath of constituents who were angry about proposals to bail out Wall Street, voted down a \$700 billion bailout package proposed by the Bush administration on Monday, September 29, 2008, the financial crisis took an even more virulent turn, despite the bailout package that was passed four days later.

A “flight to quality” drove three-month Treasury bill rates down to almost zero, rates not seen since the Great Depression of the 1930s. Credit spreads—an indicator of risk—shot through the roof, with the gap between Eurodollar and Treasury bill rates (the TED spread) going from around 40 basis points (0.40 percentage point) before the financial crisis began to over 450 basis points in mid-October, the highest value in its history. After earlier sharp declines, the stock market crashed further, with the week beginning on October 6, 2008, showing the worst weekly decline in U.S. history.

The recent financial crisis illustrates how volatile financial markets can be. This volatility hit financial consumers directly, leading to difficulty in getting loans, falling home values, and declining retirement account values, and putting jobs in jeopardy. How can policy respond to disruptions in financial markets? We begin addressing this question by examining the inner workings of financial markets, particularly interest rate dynamics. Chapter 4 explains what an interest rate is, as well as the relationships among interest rates, bond prices, and returns. Chapter 5 examines how the overall level of interest rates is determined. In Chapter 6, we extend the analysis of the bond market to explain changes in credit spreads and the relationship of long-term to short-term interest rates. Chapter 7 looks at the role of expectations in the stock market and explores what drives stock prices.