UNIT IV
Macroeconomics

CHAPTER 10
Money, Banking, and the Federal Reserve System

CHAPTER 11
Measuring Economic Performance

CHAPTER 12
Economic Changes and Cycles

CHAPTER 13
Fiscal and Monetary Policy

CHAPTER 14
Taxing and Spending
“The ideas of economists... are more powerful than is commonly understood. Indeed the world is ruled by little else.”

—John Maynard Keynes
Why It Matters

Suppose that tomorrow morning you woke up, and all the money in the world was gone. It disappeared. How would the world be different? Would it be a better or a worse place to live? Would people be more greedy, less greedy, or about the same? Would people work harder, or work less?

When someone mentions the word money, you might think of a $20 bill. Money is cold, hard cash to most of us, but money involves much more than that $20 bill. In this chapter you will begin to find out about the story of money. You will learn how money came into existence and the purposes it serves today. You will also learn about banking and the Federal Reserve System, which work together to change the amount of money in circulation at any given time. As you complete the chapter, you will begin to see how the changing money supply can affect your life in the years to come.
The following events occurred one day in February.

8:15 A.M. The members of the Federal Open Market Committee (FOMC), in Washington, D.C., will start their meeting at 9 a.m. The members of the FOMC have a lot to say on whether the money supply of the United States increases, decreases, or remains constant. Many people would like to hear what goes on at these meetings. If you knew what was discussed, you might be able to profit from it. So now, at this time, the room in which the meeting will take place is being swept for electronic bugs.

• What specifically does the FOMC do that is so important?

9:00 A.M. Mrs. Harris teaches English literature at Monroe High School and is talking about the book *The Strange Case of Dr. Jekyll and Mr. Hyde*. She reads from the book: "It was on the moral side, and in my own person, that I learned to recognize the thorough and primitive duality of man: I saw that, of the two natures that contended in the field of my consciousness, even if I could rightly be said to be either, it was only because I was radically both. . . ."

• What does Robert Louis Stevenson’s *The Strange Case of Dr. Jekyll and Mr. Hyde* have to do with the material in an economics text?

3:44 P.M. Carl listens to the news on his car radio. The newscaster states, "Today, the Fed announced that it would raise the discount rate by one-quarter of one percentage point or 25 basis points. This decision shows that the Fed is probably worried about the recent rapid rate of increase in the money supply."

• What is the discount rate and how is it related to changes in the money supply?

5:29 P.M. At NBC Studios in Burbank, California, Jay Leno, host of the *Tonight Show with Jay Leno*, is getting ready to go on. He tapes his show every weekday at this time. The announcer of the *Tonight Show* is warming up his voice. Jay goes over in his mind his first two jokes. Although he will read all of his jokes off large white posters held up in front of him, he still likes to go over in his mind his first few words.

• What does Jay Leno have to do with material in an economics text?
What’s It Like Living in a Barter Economy?

A barter economy is an economy with no money. The only way you can get what you want in a barter economy is to trade something you have for it. Suppose you have apples and want oranges. You trade two apples for three oranges.

Life in a barter economy can be difficult. It can take a lot of time and effort to get what you want. Suppose you produce utensils such as forks, spoons, and knives. No one can live on utensils alone, so you set out to trade your utensils for bread, meat, and other necessities. You come across a person who bakes bread and ask if he is willing to trade some bread for some utensils. He says, “Thank you very much, but no. I have all the utensils I need.” You ask him what he would like instead of utensils. He says he would like to have some fruit, and that if you had fruit he would be happy to trade bread for fruit.

You go on your way and find another person with bread. You ask her if she wants to trade bread for utensils. Like the first person, she says no, but she would be happy to trade bread for meat if you had any. You do not, so you move on to find another person who, you hope, will be willing to trade bread for utensils.

What is the problem here? You encounter people who have what you want but (unfortunately for you) don’t want what you have. (You find the person who has the bread that you want, but this person doesn’t want the utensils that you have.) What makes living in a barter economy difficult is that many of the people you want to trade with don’t want to trade with you.

In this type of situation, trade is time consuming. It could take all day, if not longer, to find a person who wants to trade bread for utensils. Economists state the problem this way: the transaction costs of making exchanges are high in a barter economy. Think of the transaction costs as the time and effort you have to spend before you can make an exchange. If the transaction costs could somehow be lower, trading would be easier.
Taylor wants to buy a house and a gallon of milk. He has to do more to buy a house than he has to do to buy a gallon of milk. To buy a house, he has to find the house, inspect the house, bargain on the price of the house, take out a loan to buy the house, and much more. To buy a gallon of milk, he simply walks into a grocery store, pays at the counter, and walks out. The transaction costs of buying a house are greater than the transaction costs of buying a gallon of milk.

How and Why Did Money Come to Exist?

How can an individual living in a barter economy reduce the transaction costs of making exchanges? In a barter economy with, say, 100 goods, some goods are more readily accepted in exchange than others. For example, good A might be accepted (on average) every tenth time it is offered in exchange, while good B might be accepted every seventh time. If you are going out today to trade in a barter economy, which good, A or B, would you prefer to have in your possession? The answer is B, because it is more likely to be accepted in a trade than A. In other words, to reduce the transaction costs of making exchanges, it is better to offer B than A.

Before you can offer B, though, you have to have it. So suppose someone offers to trade good B for your utensils. You don’t really want to consume good B (in the same way that you want to consume bread), but you realize that good B will be useful in making exchanges. You accept the trade because later you will use good B to lower the transaction costs of getting what you want.

Once some people begin accepting a good because it reduces the transaction costs of exchange, others will follow. After you accepted good B, it had greater acceptability than it used to have. Because you accepted it, even though it wasn’t the good you really wanted, perhaps it will be accepted every sixth time now instead of every seventh time. This greater acceptability makes good B more useful to other people than it was previously.

Then, when Pheng accepts good B, it is even more likely that someone else will accept good B. Can you see what is happening? That you accepted good B made it more likely that Pheng would accept it. That Pheng accepted it made it more likely that someone else would accept it. Eventually, everyone will accept good B in exchange. When this time arrives—when good B is widely accepted in exchange—good B is called money. Money is any good that is widely accepted in exchange and in the repayment of debts. Historically, goods that evolved into money included gold, silver, copper, rocks, cattle, and shells, to name only a few.

These Native Americans are trading furs with explorer Henry Hudson. What were some disadvantages of living in a barter economy?
want from others. “So you start accepting coconuts in trade, even though you don’t like coconuts, and because you do, the acceptability of coconuts is now even greater than before. Then someone else sees that the acceptability of coconuts is on the rise, and so she begins accepting coconuts in all trades. On it goes until almost everyone realizes that it is in their best interests to accept coconuts. Coconuts are now money.

What Gives Money Value?

Forget coconuts. Let’s turn to a $10 bill. Is a $10 bill money? The $10 bill is widely accepted for purposes of exchange, of course, and therefore it is money.

What gives money (say, the $10 bill) its value? Like good B and the coconuts in the earlier examples of a barter economy, our money (today) has value because of its general acceptability. Money has value to you because you know that you can use it to get what you want. You can use it to get what you want, however, only because other people will accept it in exchange for what they have.

Example: Imagine a time in the future. Ryan begins to walk to a local shopping center. On the way, he stops by the convenience store to buy a doughnut and milk. He tries to pay for the food with two $1 bills. The owner of the store says that he no longer accepts dollar bills in exchange for what he has to sell. This story repeats itself all day with different store owners; no one is willing to accept dollar bills for what he or she has to sell. Suddenly, dollar bills have little or no value to Ryan. If he cannot use them to get what he wants, they are simply paper and ink, with no value at all.

Example: Between 1861 and 1865, during the Civil War, in the South Confederate notes (Confederate money) had value because Confederate money was accepted by people in the South for purposes of exchange. Today in the South, Confederate money has little value (except for historical collections), because it is not widely accepted for purposes of exchange. You cannot pay for your gasoline at a service station in Alabama with Confederate notes.

Are You Better Off Living in a Money Economy?

The transaction costs of exchange are lower in a money economy than in a barter economy. In a barter economy, not everyone you want to trade with wants to trade with you. In a money economy, however, everyone you want to buy something from wants what you have—money. In short, a willing trading partner lowers the transaction costs of making exchanges.

Lower transaction costs translate into less time needed for you to trade in a money economy than in a barter economy. Using money, then, frees up some time for you. With that extra time, you can produce more of whatever it is you produce (accounting services, furniture, computers, or novels), consume more leisure, or both. In a money economy, then, people produce more goods and services and consume more leisure than they would in a barter economy. The residents of money economies are richer in goods, services, and leisure than the residents of barter economies.

The residents of money economies are more specialized, too. If you lived in a barter economy, it would be difficult and time consuming to make everyday transactions. You probably would produce many things yourself rather than deal with the hardship of
producing only one good and then trying to exchange it for so many other goods. In other words, the higher the transaction costs of trading, the less likely you would want to trade, and the more likely you would produce the goods that you would otherwise have to trade for.

In a money economy, however, it is neither difficult nor time consuming to make everyday transactions. The transaction costs
of exchange are low compared to what they are in a barter economy. You have the luxury of specializing in the production of one thing (fixing faucets, writing computer programs, teaching students), selling that one thing for money, and then using the money to buy whatever good or service you want to buy.

In only very few places in the world today is barter still practiced. In those places, you will find that the people have a low standard of material living, and they are not nearly as specialized as they are in money economies.

What Are the Three Functions of Money?

Money has three major functions: a medium of exchange, a unit of account, and a store of value.

Money as a Medium of Exchange

A medium of exchange is anything that is generally acceptable in exchange for goods and services. As we have seen, then, the most basic function of money is as a medium of exchange. Money is part of (present in) almost every exchange made.

Money as a Unit of Account

A unit of account is a common measurement used to express values. Money functions as a unit of account, which means that all goods can be expressed in terms of money. For example, we express the value of a house in terms of dollars (say, $280,000), the value of a car in terms of dollars (say, $20,000), and the value of a computer in terms of dollars (say, $2,000).

Money as a Store of Value

A good is a store of value if it maintains its value over time. Money serves as a store of value. For example, you can sell your labor services today, collect money in payment, and wait for a future date to spend the money on goods and services. You do not have to rush to buy goods and services with the money today; it will store value to be used at a future date.

To say that money is a store of value does not mean that it is necessarily a constant store of value. Let’s say that the only good in the world is apples, and the price of an apple is $1. Julio earns $100 on January 1, 2006. If he spends the $100 on January 1, 2006, he can buy 100 apples. Suppose he decides to hold the money for one year, until January 1, 2007. Suppose also that the price of apples doubles during this time to $2. On January 1, 2007, Julio can buy only 50 apples. What happened? The money lost some of its value between 2006 and 2007. If prices rise, the value of money declines.

When economists say that money serves as a store of value, they do not mean to imply that money is a constant store of value, or that it always serves as a store of value equally well. Money is better at storing value at some times than at other times. (Money is “bad” at storing value when prices are rapidly rising.)

For a summarized comparison of the three major functions of money, see Exhibit 10-1.

QUESTION: Can money lose its value very fast over a short period of time?

ANSWER: Money will lose its value fairly quickly (and therefore not be a good store of value) any time prices rise quickly over
a short period of time. A classic example is Germany in 1923 when prices were rising so quickly, and money was losing its value so fast, that workers in Germany were being paid (with money) three times a day. They might be paid in the morning, use the money right away to buy goods, then be paid in the afternoon, use that money right away to buy goods, and so on. In other words, if they waited too long to use the money they were paid, prices would have risen by so much that the amount of money they had wouldn’t buy much. So they ended up spending their money almost as quickly as they received it.

Who Were the Early Bankers?

Our money today is easy to carry and transport, but it was not always that way. For example, when money was principally gold coins, carrying it was neither easy nor safe. Gold is heavy, and transporting thousands of gold coins is an activity that could easily draw the attention of thieves. Thus, individuals wanted to store their gold in a safe place. The person most individuals turned to was the goldsmith, someone already equipped with safe storage facilities. Goldsmiths were the first bankers. They took in other people’s gold and stored it for them.

To acknowledge that they held deposited gold, goldsmiths issued receipts called warehouse receipts to their customers. For example, Adam might have a receipt from the goldsmith Turner stating that he deposited 400 gold pieces with Turner. Before long, people began to circulate the warehouse receipts in place of the gold itself (gold was not only inconvenient for customers to carry, but also inconvenient for merchants to accept). For instance, if Adam wanted to buy something for 400 gold pieces, he might give a warehouse receipt to the seller instead of going to the goldsmith, obtaining the gold, and then delivering it to the seller. Using the receipts was easier than dealing with the gold itself for both parties. In short, the warehouse receipts circulated as money—that is, they became widely acceptable for purposes of exchange.

Goldsmiths began to notice that on an average day, few people came to redeem their receipts for gold. Most individuals were simply trading the receipts for goods. At this stage, warehouse receipts were fully backed by gold. The receipts simply represented, or stood in place of, the actual gold in storage.

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**EXHIBIT 10-1 The Major Functions of Money**

<table>
<thead>
<tr>
<th>Function</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium of exchange</td>
<td>Anything that is generally acceptable in exchange for goods and services</td>
<td>John uses money to buy haircuts, books, food, CDs, and computers. Money is the medium of exchange.</td>
</tr>
<tr>
<td>Unit of account</td>
<td>Common measurement in which values are expressed</td>
<td>The price of a candy bar is $1, and the price of a book is $14. The exchange value of both goods is measured by dollars (unit of account). Notice that exchange values can be compared easily when money is used. In this example, the book has 14 times the exchange value of the candy bar.</td>
</tr>
<tr>
<td>Store of value</td>
<td>An item that maintains value over time</td>
<td>Phil has a job and gets paid $100. He could use $100 to buy a ski jacket that he wants, but he decides not to. Instead, he saves the $100 and buys the ski jacket six months later. For Phil, money has acted as a store of value over the six-month period.</td>
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</tbody>
</table>
Some goldsmiths, however, began to think, “Suppose I lend out some of the gold that people have deposited with me. If I lend it to others, I can charge interest for the loan. And since receipts are circulating in place of the gold, I will probably never be faced with redeeming everyone’s receipts for gold at once.” Some goldsmiths did lend out some of the gold deposited with them and collected the interest on the loans. The consequence of this lending activity was an increase in the supply of money, measured in terms of gold and paper receipts. Remember, both gold and paper warehouse receipts were widely accepted for purposes of exchange.

A numerical example can show how the goldsmiths’ activities increased the supply of money. Suppose the world’s entire money supply is made up of 100 gold coins. Now suppose the owners of the gold deposit their coins with the goldsmith. To keep things simple, suppose the goldsmith gives out 1 paper receipt for each gold coin deposited. In other words, if Flores deposits 3 coins with a goldsmith, she receives 3 warehouse receipts, each representing a coin.

The warehouse receipts begin to circulate instead of the gold itself, so the money supply consists of 100 paper receipts, whereas before it consisted of 100 gold coins. Still, the number is 100. So far, so good.

Now the goldsmith decides to lend out some of the gold and earn interest on the loans. Suppose Robert wants to take out a loan for 15 gold coins. The goldsmith grants the loan. Instead of handing over 15 gold coins, though, the goldsmith gives Robert 15 paper receipts.

What happens to the money supply? Before the goldsmith went into the lending business, the money supply consisted of 100 paper receipts. Now, though, the money supply has increased to 115 paper receipts. The increase in the money supply (as measured by the number of paper receipts) is a result of the lending activity of the goldsmith.

The process described here was the beginning of fractional reserve banking. We live under a fractional reserve banking system today. Under a fractional reserve banking system, such as the one that currently operates in the United States, banks (like the goldsmiths of years past) create money by holding on reserve only a fraction of the money deposited with them and lending the remainder.

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**Defining Terms**

1. Define:
   a. barter economy
   b. transaction costs
   c. money
   d. medium of exchange
   e. unit of account
   f. store of value
   g. fractional reserve banking

**Reviewing Facts and Concepts**

2. What gives money its value?
3. Money serves as a unit of account. Give an example to illustrate what this means.
4. What does it mean to say that the United States has a fractional reserve banking system?

**Critical Thinking**

5. Is specialization in a money economy more or less likely to happen than in a barter economy?
What Are the Components of the Money Supply?

The most basic money supply—sometimes referred to as M1 (M-one)—consists of three components we will soon identify. Other “money supplies” besides M1 include a broader measure of the money supply called M2 (M-two). For purposes of simplicity, when we discuss the money supply in this text, we are referring to M1. The M1 in the United States is composed of (1) currency, (2) checking accounts, and (3) traveler’s checks.

1. **Currency.** Currency includes both coins (such as quarters and dimes) minted by the U.S. Treasury and paper money. The paper money in circulation consists of Federal Reserve notes. If you look at a dollar bill, you will see at the top the words “Federal Reserve Note.” The Federal Reserve System, which is the central bank of the United States (discussed in a later section), issues Federal Reserve notes.

2. **Checking accounts.** Checking accounts are accounts in which funds are deposited and can be withdrawn simply by writing a check. Sometimes checking accounts are referred to as demand deposits, because the funds can be converted to currency on demand and given to the person to whom the check is made payable. For example, suppose Malcolm has a checking account at a local bank with a balance of $400. He can withdraw up to $400 currency from his account, or he can transfer any dollar amount up to $400 to someone else by simply writing a check to that person.

3. **Traveler’s checks.** A traveler’s check is a check issued by a bank in any of several denominations ($10, $20, $50, and so on) and sold to a traveler (or to anyone who wishes to buy it), who signs it at the time it is issued by the bank and then again in the presence of the person cashing it.

In August 2005, $710 billion in currency was in circulation, along with $619 billion in money supply.

Focus Questions

- What does the money supply consist of?
- What is a Federal Reserve note?
- What is and what is not “money”?
- What causes interest rates to change?

Key Terms

- money supply
- currency
- Federal Reserve note
- demand deposit
- savings account
- near-money
- loanable funds market
The money supply consists of currency, checking accounts (balances), and traveler’s checks. The amounts shown represent the money supply in August 2005.

checking accounts, and $7 billion in traveler’s checks. Altogether, the money supply equaled $1,336 billion (see Exhibit 10-2).

You might be wondering why debit cards aren’t mentioned; after all, you can buy products with a debit card in the same way that you can with currency. Do you see why the debit cards aren’t included in our list? They are already represented in checking accounts. When you use a debit card, money is removed from your checking account in the same way that it is when you write a check.

Another card that some people might in the future think of as currency are smart cards. A smart card resembles a credit card in shape and size, but it is not just a simple piece of plastic the way a credit card is. Inside it is an embedded 8-bit microprocessor. A smart card can be used for many things, and it can hold significant amounts of data. For purposes here, though, we need to point out that a monetary value can be placed on a smart card (much like a monetary value can be placed on a card at a video arcade), and then the card can be used to make on-the-spot purchases, much like currency is used for the same thing.

Is a Savings Account Money?

A savings account is an interest-earning account. For example, if you have $400 in your savings account and the annual interest rate you are paid is 6 percent, in a year your savings account will increase to $424. With some savings accounts, you can write checks; others you cannot. Savings accounts on which you can write checks fall into the category of checking accounts, which were discussed earlier. A passbook savings account is an example of a nonchecking savings account. When you deposit your money into a passbook savings account, you are given a small booklet in which deposits, withdrawals, and interest are recorded.

A nonchecking savings account is not considered money because it is not widely accepted for purposes of exchange. No person can go into a store, show the salesperson the balance in a passbook savings account, and buy a $40 sweater. However, nonchecking savings accounts are considered near-money. Near-money is anything that can be relatively easily and quickly turned into money. A person cannot buy a sweater by telling the salesperson that she has so much “money” in her passbook savings account, but she can go to the bank and request that her nonchecking savings be returned to her in currency (“I’ll take it in twenties”).

A Student Asks

QUESTION: I am used to thinking that only the cash and change I have in my wallet is money. Are we saying cash is only one component of money?

ANSWER: Yes, that is exactly what we are saying. Remember that money is anything that is widely accepted in exchange and in the repayment of debt. The cash and change in your wallet (the currency in your wallet) is widely accepted in exchange and in the repayment of debt, so it is money. The check you might write out for $100 is also accepted in exchange and in the repayment of debt, so it is money. Traveler’s checks are also widely accepted in exchange and in the repayment of debt, so they are money too. In summary, money consists of currency plus checking accounts plus traveler’s checks.
Are Credit Cards Money?

You’re out on a Friday night with your friends eating pizza. Someone asks, “Anyone here got any money?” You say, “I have a credit card.” Your friends say, “Good enough.”

Is a credit card money? After all, it is often referred to as “plastic money,” and most retailers accept credit cards as payment for purchases. On closer examination, we can see that a credit card is not money.

Consider Tina, who decides to buy a pair of shoes. She hands the shoe clerk her Visa card and signs for the purchase. Essentially, what the Visa card allows Tina to do is take out a loan from the bank that issued the card. The shoe clerk knows that this bank has, in effect, promised to pay the store for the shoes. At a later date, the bank will send Tina a credit card bill. At that time, Tina will be required to reimburse the bank for the shoe charges, plus interest (if her payment is made after a certain date). Tina is required to discharge her debt to the bank with money, such as currency or a check written on her checking account.

Can you see that a credit card is not money? Money has to be both widely used for exchange and be used in the repayment of debt. A credit card is not used to repay debt but rather to incur it. It is an instrument that makes it easier for the holder to

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<th>Year</th>
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<td>1989</td>
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<td>1990</td>
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obtain a loan. The use of a credit card places a person in debt, which he or she then has to repay with money.

Don’t think of the card as money because it isn’t money. Think of it as what it is—a piece of plastic that allows you to take out a loan from the bank that issued the card.

In other words, when you hand the credit card to the cashier to pay for the pizza, or shoes, or new CD, it is you and the bank standing up there in front of the cashier—not just you alone. The bank is saying to you, “Here, we are going to lend you some ‘money’ to pay for the item. Oh, and by the way, we want you to pay us back later, with interest.”

To get a better understanding of credit cards, turn to page 268 and read about “The Psychology of Credit Cards” in the “Your Personal Economics” feature.

**Borrowing, Lending, and Interest Rates**

As you know, when a person uses a credit card, he or she is actually borrowing funds from a bank. In other words, the person is a borrower and the bank is a lender. Often, when loans are made, an interest rate must be paid for the loan.

Now if we look at interest rates (for loans) over time, we see that sometimes interest rates are higher than at other times. For example, in the 1970s, interest rates were relatively high. In 2004, interest rates were relatively low.

Why are interest rates high at some times and low at other times? The answer has to do with supply and demand, which you learned about in Chapters 4 through 6. Interest rates are determined in the loanable funds market.
market in much the same way that apple prices are determined in the apple market, computer prices are determined in the computer market, and house prices are determined in the housing market.

The loanable funds market includes a demand for loans and a supply of loans. The demanders of loans are called borrowers; the suppliers of loans are called lenders. Through the interaction of the demand for and supply of loans, the interest rate is determined.

What happens if the demand for loans rises? Obviously, if the demand for loans rises and the supply remains constant, the price of a loan, which is the interest rate, rises. What happens if the demand for loans falls? The interest rate falls. What happens if the supply of loans rises? The interest rate falls. What happens if the supply of loans falls? The interest rate rises.

Sometimes people make a distinction between short-term interest rates and long-term interest rates. The terms short and long refer to the time period of the loan. For example, if you were to take out a six-month loan, it would likely be referred to as a short-term loan, in contrast to, say, a 30-year loan, which would be referred to as a long-term loan. The interest rate you paid (as a borrower) for the six-month loan would be referred to as a short-term interest rate; the interest rate you paid for the 30-year loan would be referred to as a long-term interest rate.

Defining Terms
1. Define:
   a. money supply
   b. currency
   c. Federal Reserve note
   d. demand deposit
   e. savings account
   f. near-money

Reviewing Facts and Concepts
2. What is the official name for a “dollar bill”? (Hint:
   Look at a dollar bill and see what is written at the top.)

3. What is the difference between near-money and money?

Critical Thinking
4. Credit cards are widely accepted for purposes of exchange, yet they are not money. Why not?

Applying Economic Concepts
5. Take a look at a Federal Reserve note. On it, you will read the following words: “This note is legal tender for all debts, public and private.” What part of the definition of money does this message refer to?
If you work to earn $50, do you use the money in the same way that you would use a $50 gift? Many economic studies show that people often are more serious with money they earn than with money they win or receive as a gift. In reality, a dollar is a dollar, no matter from where it came. But in everyday life, we see a dollar earned as somehow different from a dollar won.

$100 “Out the Window”

Suppose you plan to go to a concert, and the ticket costs $100. You buy the ticket on Monday to attend the concert on Friday. When Friday night comes, you realize you lost the ticket. Assuming that tickets are still available, do you buy another? Answer the question before reading further.

Now let's change the circumstances. Suppose instead of buying the ticket on Monday, you plan to buy it on Friday, right before the concert. At the ticket window on Friday night, you realize that on your way to the concert you lost $100 out of your wallet. You brought plenty of money so you still have enough to buy the ticket. Do you buy it?

The Economist Says...

According to economists, the two settings present you with the same choice. In both settings, you have to spend another $100 to see the concert. Because the two settings present you with the same choice, economists argue that you will behave the same in the two settings. If you decide not to buy another ticket in the first setting, then you shouldn't in the second. If you do decide to buy another ticket in the first setting, then you should in the second.

But in Real Life...

People don't seem to behave the way that economists predict, however. Many people, when asked the two questions in this example, say that they will not buy a second ticket if they lost the first ticket, but they will buy a ticket if they lost $100. Why? These people argue that spending an additional $100 on an additional ticket is like spending $200 to see the concert, which is too much to pay. However, they don't see themselves spending $200 to see the concert when they lose $100 on the way to the concert and pay $100 for a ticket. To these people, the situations are completely different.

Economists say that the people who answer the two questions differently—although both settings offer the same basic choice—are compartmentalizing. They are treating two $100 amounts differently, as if they come from two different compartments. The concert ticket example shows that people do compartmentalize when it comes to money. They don't always treat a dollar in the same way.

Cash Versus Credit Cards

With this example in mind, let's compare using cash to using a credit card. Say a person has $500 in cash and a credit card in her wallet. She wants to purchase something that costs $480. She could use the cash to make the purchase, or she could put the purchase on her credit card (and pay off the credit card later). In this situation, many people will say that it is somehow easier to use the credit card than to pay cash. When they pay cash, they say, they have a harder time making the decision to purchase the item. Somehow it seems more real to them; somehow the purchase seems more expensive.

You and Your Lending Partner

It may be easier to use a credit card than to pay cash, but it certainly is not cheaper. In fact, it can be more expensive. If you don’t pay credit card balances off monthly, you will end up paying interest on the loan the bank provided you via your credit card purchase.
In a sense, when you buy something with a credit card, two people, not one, stand in front of the cashier making the purchase. First is you, handing over your credit card. Plus, “standing” next to you, is “your partner” representing the bank. This imaginary partner is there with you, issuing you a loan to make the purchase with the credit card. Later, your “partner” from the bank will come back to you and ask to be repaid for the loan, with interest. In other words, a $100 item will cost you $100 if you pay in cash, but it could cost you $110 if you pay with a credit card ($100 for the purchase and $10 interest paid for the $100 loan).

**An Expensive Lesson**

Making a credit card purchase might be easier (for you) than a cash purchase of the same denomination, but often it is a costlier purchase. Not realizing this can lead to serious financial trouble, as far too many people have learned the hard way.

Consider Kevin (a real person whose name has been changed). He went off to college with a credit card. The first two months at college he used the credit card for all his purchases—many purchases. Kevin purchased new clothes, took his friends out to eat regularly, and bought an expensive television for his dorm room.

When Kevin received the credit card bill, he was shocked at just how much he had spent. (It seemed so easy to spend when he was out with his friends having a good time.) He said he felt as if someone else had spent the money. In his words, “It felt like I was getting things for free.”

Now Kevin certainly was smart enough to know that he wasn’t getting anything for free, but he wasn’t stating what he knew, he was telling us how he felt. Looking back, he realized his compartmentalizing caused him to buy a lot more than he would have if he paid in cash. In the end he had to work many more hours (than he had wanted to) to pay off his credit card bill.

**My Personal Economics Action Plan**

Here are some points you may want to consider and some guidelines you might want to put into practice.

1. **Check or Cash**
   - Someone once said that if you know where the holes are, you are less likely to step in them. Does this observation apply to credit cards? If you know that credit cards can be abused, then you are less likely to get into financial trouble with credit cards.
   
   I will not use a credit card instead of a check or cash until I am ______ years old and have proven to myself that I am financially responsible.

2. **Spend Only**
   - Keep in mind that people do sometimes compartmentalize. For them, a dollar is not always a dollar. The truth of the matter is, people are deceiving themselves: A dollar is a dollar is a dollar.
   
   In the future, I will spend only _____ percent of money gifts I receive, and I will save _____ percent.

3. **Cut of the Cost**
   - If you use a credit card to buy something that costs $100, you may end up paying more than $100 for the item. Generally speaking, using a credit card to buy something makes that something costlier than using cash.
   
   I will not use a credit card unless I know for sure that I will be able to pay my bill in full when it comes.
What Is the Federal Reserve System?

In 1913, Congress passed the Federal Reserve Act. This act set up the Federal Reserve System, which began operation in 1914. (The popular name for the Federal Reserve System is “the Fed.”) The Fed is a central bank, which means it is the chief monetary authority in the country. A central bank has the job of determining the money supply and supervising banks, among other things. Today, the principal components of the Federal Reserve System are (1) the Board of Governors, and (2) the 12 Federal Reserve district banks.

Board of Governors

The Board of Governors of the Federal Reserve System controls and coordinates the Fed’s activities. The board is made up of seven members, each appointed to a 14-year term by the president of the United States with Senate approval. The president also designates one member as chairperson of the board for a 4-year term. The Board of Governors is located at 20th Street and Constitution Avenue in Washington, D.C.

The 12 Federal Reserve District Banks

The United States is broken up into 12 Federal Reserve districts. Exhibit 10-3 shows the boundaries of these districts. Each district has a Federal Reserve district bank. (Think of the Federal Reserve district banks as “branch...
offices” of the Federal Reserve System.) Each of the 12 Federal Reserve district banks has a president. Which Fed district do you live in?

**An Important Committee: The FOMC**

The major policy-making group within the Fed is the Federal Open Market Committee (FOMC). A later part of this chapter will consider what the FOMC does, but for now you need only note that the FOMC is made up of 12 members. Seven of the 12 members are the members of the Board of Governors. The remaining five members come from the ranks of the presidents of the Federal Reserve district banks.

**What Does the Fed Do?**

The following is a brief description of six major responsibilities of the Fed.

1. **Control the money supply.** A full explanation of how the Fed controls the money supply comes later in the chapter.
2. **Supply the economy with paper money (Federal Reserve notes).** As stated in an earlier section, the pieces of paper money we use are Federal Reserve notes. Federal Reserve notes are printed at the Bureau of Engraving and Printing in Washington, D.C. The notes are issued to the 12 Federal Reserve district banks,

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**Federal Reserve Districts and Federal Reserve Bank Locations**

Alaska and Hawaii are part of the San Francisco District

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**Federal Open Market Committee (FOMC)**

The 12-member policy-making group within the Fed. This committee has the authority to conduct open market operations.

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What government agency is responsible for printing our paper money?
which keep the money on hand to meet the demands of the banks and the public. For example, suppose it is the holiday season, and people are going to their banks and withdrawing greater than usual numbers of $1, $5, and $20 notes. Banks need to replenish their supplies of these notes, and they turn to their Federal Reserve district banks to do so.

3. **Hold bank reserves.** Each commercial bank that is a member of the Federal Reserve System is required to keep a **reserve account** (think of it as a checking account) with its Federal Reserve district bank. For example, a bank located in Durham, North Carolina, would be located in the fifth Federal Reserve district, which means it deals with the Federal Reserve Bank of Richmond (Virginia). The local bank in Durham must have a reserve account, or checking account, with this reserve bank. Soon we will see what role a bank’s reserve account with the Fed plays in increasing and decreasing the money supply.

4. **Provide check-clearing services.** When someone in Miami (Florida) writes a check to a person in Savannah (Georgia), what happens to the check? The process by which funds change hands when checks are written is called the check-clearing process. The Fed plays a major role in this process. Here is how it works (see Exhibit 10-4):

   a. Suppose Harry writes a $1,000 check on his Miami bank and sends it by mail to Ursula in Savannah. To record this transaction, Harry reduces the balance in his checking account by $1,000. In other words, if his balance was $2,500 before he wrote the check, it is $1,500 after he wrote the check.

   b. Ursula receives the check in the mail. She takes the check to her local bank, endorses it (signs it on the back), and deposits it into her checking account. The balance in her account rises by $1,000.

   c. Ursula’s Savannah bank sends the check to its Federal Reserve district bank, which is located in Atlanta. The Federal Reserve Bank of Atlanta increases the reserve account of the
Savannah bank (Ursula’s bank) by $1,000 and decreases the reserve account of the Miami bank (Harry’s bank) by $1,000.

d. The Federal Reserve Bank of Atlanta sends the check to Harry’s bank in Miami, which then reduces the balance in Harry’s checking account by $1,000. Harry’s bank in Miami either keeps the check on record or sends it along to Harry with his monthly bank statement.

5. Supervise member banks. Without warning, the Fed can examine the books of member commercial banks to see what kind of loans they made, whether they followed bank regulations, how accurate their records are, and so on. If the Fed finds that a bank has not followed established banking standards, it can pressure the bank to do so.

6. Serve as the lender of last resort. A traditional function of a central bank is to serve as the “lender of last resort” for banks suffering cash management problems. For example, let’s say that bank A lost millions of dollars and finds it difficult to borrow from other banks. At this point, the Fed may step in and act as lender of last resort to bank A. In other words, the Fed may lend bank A the funds it wants to borrow when no one else will.

**Defining Terms**

1. Define:
   a. Federal Open Market Committee (FOMC)
   b. Federal Reserve System (the Fed)
   c. Board of Governors of the Federal Reserve System
   d. reserve account

**Reviewing Facts and Concepts**

2. In what year did the Fed begin operating?
3. Explain how a check is cleared.
4. What does it mean when we say the Fed is the lender of last resort?

**Critical Thinking**

5. Economists speak about printing, issuing, and supplying paper money. Are these different functions? Where is each function performed?

**Applying Economic Concepts**

6. Do you think banks need the Fed to act as “lender of last resort” more often during good economic times or bad economic times? Explain your answer.
Different Types of Reserves

Here you are going to learn how the money supply in the United States is increased (more money) and decreased (less money). Before you can understand the difference, it is important to know the different types of a bank’s reserves. The following points and definitions are crucial to an understanding of how the money supply rises and falls.

1. The previous section mentioned that each member bank has a reserve account, which is simply a checking account that a commercial bank has with its Federal Reserve district bank. If we take the dollar amount of a bank’s reserve account and add it to the cash the bank has in its vault (called, simply enough, vault cash), we have the bank’s total reserves.

2. A bank’s total reserves can be divided into two types: required reserves and excess reserves. Required reserves are the amount of reserves a bank must hold against its deposits as mandated by the Fed. For example, suppose bank A holds checking account deposits (checkbook money) for its customers totaling $100 million. The Fed requires, through its reserve requirement, that bank A hold a percentage of this total amount in the form of reserves—that is, either as deposits in its reserve account at the Fed or as vault cash.
(because both of these are reserves). If the reserve requirement is 10 percent, bank A is required to hold 10 percent of $100 million, or $10 million, in the form of reserves. This $10 million is called required reserves.

\[
\text{Required reserves} = \text{Reserve requirement} \times \text{Checking account deposits}
\]

3. **Excess reserves** are the difference between total reserves and required reserves. For example, if total reserves equal $25 million and required reserves equal $10 million, then excess reserves would be $15 million. See Exhibit 10-5 for a review of these points.

4. Banks can make loans with their excess reserves. For example, if bank A has excess reserves of $15 million, it can make loans of $15 million.

(You may not realize it, but you just read a very short but very important section of this chapter. In this section you were introduced to four new terms—total reserves, required reserves, reserve requirement, and excess reserves. If you are not absolutely sure what each term refers to, you should go back and read this section again. These four terms will be used often in the discussion that follows. You don’t want to be in the thick of the discussion asking yourself, “What are required reserves again?”)

### How Banks Increase the Money Supply

Earlier we said that the money supply is the sum of three components: currency (coins and paper money), checking account deposits, and traveler’s checks. For example, $710 billion in currency, $619 billion in checking account deposits, and $7 billion in traveler’s checks mean that the money supply is $1,336 billion. You will recall that checking account deposits are sometimes referred to as demand deposits because a checking account contains funds that can be withdrawn not only by a check but also on demand.

Banks (such as your local bank down the street) are not allowed to print currency. Your bank cannot legally print a $10 bill. (No matter how hard you look, you are not going to find a money-printing machine in the bank.) However, banks can create checking account deposits (checkbook money), and if they do, they increase the money supply. The following discussion explains the process.

### Creating Checking Account Deposits

To see how banks use checking account deposits to increase the money supply, let’s imagine a fictional character named Fred. (His name rhymes with Fed for a reason you will learn later.) Fred is somewhat of a magician: he can snap his fingers and create a $1,000 bill out of thin air. On Monday

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**EXHIBIT 10-5 Reserves: Total, Required, and Excess**

<table>
<thead>
<tr>
<th>Kind of reserves</th>
<th>What it equals</th>
<th>Numerical example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total reserves</td>
<td>Total reserves = Deposits in the reserve account at the Fed + Vault cash</td>
<td>Deposits in the reserve account = $10 million&lt;br&gt;Vault cash = $15 million&lt;br&gt;Total reserves = $25 million</td>
</tr>
<tr>
<td>Required reserves</td>
<td>Required reserves = Reserve requirement \times Checking account deposits</td>
<td>Reserve requirement = 10%&lt;br&gt;Checking account deposits = $100 million&lt;br&gt;Required reserves = $10 million</td>
</tr>
<tr>
<td>Excess reserves</td>
<td>Excess reserves = Total reserves – Required reserves</td>
<td>Total reserves = $25 million&lt;br&gt;Required reserves = $10 million&lt;br&gt;Excess reserves = $15 million</td>
</tr>
</tbody>
</table>

---

A summary of the different types of reserves.
morning at 9:00, outside bank A, Fred snaps his fingers and creates a $1,000 bill. He immediately walks into the bank, opens up a checking account, and tells the banker that he wants the $1,000 deposited into his checking account. The banker gladly complies. Entry (a) in Exhibit 10-6 shows this deposit.

Now what does the bank physically do with the $1,000 bill? It places it into its vault, which means the money found its way into vault cash, which is part of total reserves. (Total reserves = Deposits in the reserve account at the Fed + Vault cash.) Thus, if vault cash goes up by $1,000, total reserves increase by the same amount. (If you need to check back to the earlier equations to see this total, do it now.)

To keep things simple, let’s assume that bank A had no checking account deposits before Fred walked into the bank. Now it has $1,000. Also, let’s say that the Fed set the reserve requirement at 10 percent. What are bank A’s required reserves? Required reserves equal the reserve requirement multiplied by checking account deposits. Bank A’s $1,000 \times 0.10 = $100, which is the amount bank A has to keep in reserve form—either in its reserve account at the Fed or as vault cash. Look at entry (b) in Exhibit 10-6.

Currently, however, bank A has more than $100 in its vault; it has the $1,000 that Fred handed over to it. What, then, do its excess reserves equal? Because excess reserves equal total reserves minus required reserves, it follows that the bank’s excess reserves equal $900, the difference between $1,000 (total reserves) and $100 (required reserves), as in entry (c) in Exhibit 10-6.

**What Does the Bank Do with Excess Reserves?**

What does bank A do with its $900 in excess reserves? It creates new loans with the money. For example, suppose Alexi walks into bank A and asks for a $900 loan. The loan officer at the bank asks Alexi what she wants the money for. She tells the loan officer she wants a loan to buy a television set, and the loan officer grants her the loan.

---

**EXHIBIT 10-6 The Banking System Creates Demand Deposits (Money)**

<table>
<thead>
<tr>
<th>Bank</th>
<th>New checking account deposits (new reserves)</th>
<th>Required reserves</th>
<th>Excess reserves, new loans, or new bank-created checking account deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$1,000 (a)</td>
<td>$100 (b)</td>
<td>$900 (c)</td>
</tr>
<tr>
<td>B</td>
<td>$900 (d)</td>
<td>$90 (e)</td>
<td>$810 (f)</td>
</tr>
<tr>
<td>C</td>
<td>$810</td>
<td>$81</td>
<td>$729</td>
</tr>
<tr>
<td>D</td>
<td>$729</td>
<td>$72.90</td>
<td>$656.10</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>$10,000</td>
<td>$1,000</td>
<td>$9,000</td>
</tr>
</tbody>
</table>

This amount was created by Fred.

This amount was created by the banks.

Created by Fred: $1,000

Created by banking system: $9,000

Created by Fred and banking system: $10,000

Create this diagram and the explanation in the text to see how banks increase the money supply.
Some people may think that at this point the loan officer of the bank simply walks over to the bank’s vault, takes out $900 in currency, and hands it to Alexi. It does not happen this way. Instead, the loan officer opens up a checking account for Alexi at bank A and informs her that the balance in the account is $900. See entry (c) in Exhibit 10-6. In other words, banks give out loans in the form of checking account deposits. (This point is important to remember as we continue.)

What has bank A done by opening up a checking account (with a $900 balance) for Alexi? It has, in fact, increased the money supply by $900. Remember that the money supply consists of (1) currency, (2) checking account deposits, and (3) traveler’s checks. When bank A opens up a checking account (with a balance of $900) for Alexi, the dollar amount of currency has not changed, nor has the dollar amount of traveler’s checks. The only thing that has changed is the dollar amount of checking account deposits, or checkbook money. It is $900 higher, so the money supply is $900 higher, too.

At this point you might ask, “But isn’t the $900 Alexi receives from the bank part of the money that Fred deposited in the bank?” To say that Fred does not have the $1,000 anymore, but Alexi has $900 of it, is not exactly correct. Fred does not have the $1,000 in currency anymore, but he does still have $1,000. In other words, he doesn’t have the $1,000 on him, in his wallet. It is now in the bank vault. He does have a checking account with a balance of $1,000. Alexi now has $900 in her checking account as well, an additional $900, created by the bank, that did not exist before.

**A Student Asks**

**QUESTION:** Does the bank have to create a loan with its excess reserves?

**ANSWER:** No, it does not have to create a loan with its excess reserves, but lending money is what banks do. That is how banks generate income. A bank is a business like any other business, trying to make a profit. Banks extend loans to customers to earn income in much the same way that a farmer grows and sells corn to earn an income. If a bank were to hold on to its excess reserves, it would be ignoring an opportunity to earn income.

What Happens After a Loan Is Granted?

So far, Alexi is given a loan in the form of a $900 balance in a new checking account. She now goes to a retail store and buys a $900 television set. She pays for the set by writing out a check for $900 drawn on bank A. She hands the check to the owner of the store, Roberto.

At the end of the business day, Roberto takes the check to bank B. For simplicity’s sake, we assume that checking account deposits in bank B equal zero. Roberto, however, changes this situation by depositing the $900 into his checking account. See entry (d) in Exhibit 10-6.

At this point, the check-clearing process (described earlier) kicks in. Bank B sends the check to its Federal Reserve bank, which increases the balance in bank B’s reserve account by $900. At the same time, the Federal Reserve bank decreases the funds in bank A’s reserve account by $900. Once the Federal Reserve bank increases the balance in bank B’s reserve account, total reserves for
bank B rise by $900. (Total reserves = Deposits in the reserve account at the Fed + Vault cash.) Again, see entry (d) in Exhibit 10-6.

What happens to the checking account deposits at bank B? They rise to $900, too. Bank B is required to keep a percentage of the checking deposits in reserve form. If the reserve requirement is 10 percent, then $90 has to be maintained as required reserves as in entry (e) in Exhibit 10-6. The remainder, or excess reserves ($810), can be used by bank B to extend new loans or create new checking account deposits (which are money), as in entry (f) in Exhibit 10-6. The story continues in the same way with other banks (banks C, D, E, and so on).

**QUESTION:** In the story so far, bank A creates a loan, then bank B creates a loan, then bank C creates a loan and so on. Does this process ever stop?

**ANSWER:** Yes, it stops when the dollar amounts that a bank can lend out become tiny. For example, notice that
How Much Money Was Created?

So far, bank A created $900 in new loans or checking account deposits, and bank B created $810 in new loans or checking account deposits. If we continue by bringing in banks C, D, E, and so on, we will find that all banks together—that is, the entire banking system—create $9,000 in new loans or checking account deposits (money) as a result of Fred’s deposit. This dollar amount is boxed in Exhibit 10-6. This $9,000 is new money—money that did not exist before Fred snapped his fingers, created $1,000 out of thin air, and then deposited it into a checking account in bank A.

The facts can be summarized as follows:

1. Fred created $1,000 in new paper currency (money) out of thin air.
2. After Fred deposited the $1,000 in bank A, the banking system as a whole created $9,000 in additional checking account deposits (money).

Thus, Fred and the banking system together created $10,000 in new money. Fred created $1,000 in currency, and the banking system created $9,000 in checking account deposits. Together, they increased the money supply by $10,000.

You can use the following simple formula to find the (maximum) change in the money supply ($10,000) brought about in the example:

$$\text{Change in money supply} = \frac{1}{\text{Reserve requirement}} \times \text{Change in reserves of first bank}$$

In the example, the reserve requirement was set at 10 percent (0.10). The reserves of bank A, the first bank to receive the injection of funds, changed by $1,000. Put the data into the formula:

$$\text{Change in the money supply} = \frac{1}{0.10} \times 1,000 = 10,000$$

The idea here is that $1,000 created by Fred ends up increasing the money supply by a specific multiple (in this example, the multiple is 10).

Defining Terms

1. Define:
   a. total reserves
   b. required reserves
   c. reserve requirement
   d. excess reserves

Reviewing Facts and Concepts

2. Fred creates $2,000 in currency with the snap of his fingers and deposits it in bank A. The reserve requirement is 10 percent. By how much does the money supply increase?
3. Bank A has checking account deposits of $20 million, the reserve requirement is 10 percent, vault cash equals $2 million, and deposits in the reserve account at the Fed equal $1 million. What do required reserves equal? What do excess reserves equal?
4. The numerical examples in this section always had banks creating loans (new checking account deposits) equal to the amount of excess reserves they held. For example, if bank A had $900 in excess reserves, it would create new loans equal to $900, not something less. In reality, banks may not lend out every dollar of their excess reserves, but they usually come close. Why would a bank want to lend out nearly all (if not all) of its excess reserves?

Critical Thinking

4. Is a $100 check money? Explain.

Applying Economic Concepts

5. Is a $100 check money? Explain.
Fed Tools for Changing the Money Supply

Changing the Reserve Requirement

Think of the Fed as having three “buttons” to push. Every time it pushes one of the three buttons, it either raises or lowers the money supply. The first button is the reserve requirement button. To understand how a change in it can change the money supply, let’s consider three cases. In each case, the money supply is initially zero, and $1,000 is created out of thin air. The difference in the three cases is the reserve requirement, which is 5 percent in the first case, 10 percent in the second, and 20 percent in the third. Let’s calculate the change in the money supply in each of the three cases. For these calculations we will use the formula you learned in the last section:

\[
\text{Change in money supply} = \frac{1}{\text{Reserve requirement}} \times \text{Change in reserves of first bank}
\]

Case 1: (Reserve requirement = 5%);
Change in money supply = \( \frac{1}{0.05} \times $1,000 = $20,000 \)

Case 2: (Reserve requirement = 10%);
Change in money supply = \( \frac{1}{0.10} \times $1,000 = $10,000 \)

Case 3: (Reserve requirement = 20%);
Change in money supply = \( \frac{1}{0.20} \times $1,000 = $5,000 \)

Note that the money supply is the largest ($20,000) when the reserve requirement is 5 percent. The money supply is the smallest ($5,000) when the reserve requirement is 20 percent. You can see that the smaller the reserve requirement, the bigger the change in the money supply. So, ask yourself what happens to the money supply if the reserve requirement is lowered? Obviously, the money supply must rise. What happens to the money supply if the reserve requirement is raised? Obviously, the money supply must fall.

Thus, the Fed can increase or decrease the money supply by changing the reserve requirement. If the Fed decreases the reserve requirement, the money supply increases; if it increases the reserve requirement, the money supply decreases.

Lower reserve requirement → Money supply rises
Raise reserve requirement → Money supply falls

Focus Questions
- How does a change in the reserve requirement change the money supply?
- How does an open market operation change the money supply?
- How does a change in the discount rate change the money supply?

Key Terms
open market operations
federal funds rate
discount rate
QUESTION: Why would the Fed want to increase or decrease the money supply? Why not simply leave the money supply alone?

ANSWER: You are asking a question about monetary policy, a topic we will discuss more fully in a later chapter. For now, though, let us just say that the Fed may increase or decrease the money supply to deal with some economic problem. For example, if businesses are not doing well, and the unemployment rate is rising, the Fed might want to increase the money supply to stimulate consumer spending.

Open Market Operations

The second button the Fed can “push” to change the money supply is the open market operations button. Remember that earlier we mentioned an important committee in the Federal Reserve System, the Federal Open Market Committee (FOMC). This committee of 12 members conducts open market operations. Open market operations are simply the buying and selling of government securities by the Fed. Before we discuss open market operations in detail, we need to provide some background information that relates to government securities and the U.S. Treasury.

The U.S. Treasury is an agency of the U.S. government. The Treasury’s job is to collect the taxes and borrow the money needed to run the government. Suppose the U.S. Congress decides to spend $1,800 billion on various federal government programs. The U.S. Treasury has to pay the bills. It notices that it collected only $1,700 billion in taxes, which is $100 billion less than Congress wants to spend. It is the Treasury’s job to borrow the $100 billion from the public. To borrow this money, the Treasury issues or sells government (or Treasury) securities to members of the public. A government security is no more than a piece of paper promising to pay a certain dollar amount of money in the future; think of it as an IOU statement.

The Fed (which is different from the Treasury) may buy government securities from any member of the public or sell them. When the Fed buys a government security, it is said to be conducting an open market purchase. When it sells a government security, it is said to be conducting an open market sale. These operations affect the money supply.

Open Market Purchases

Let’s say that you currently own a government security, which the Fed offers to purchase from you for $10,000. You agree to sell your security to the Fed. You hand it over, and in return you receive a check made out to you for $10,000.

It is important to realize where the Fed gets this $10,000. It gets the money “out of thin air.” Remember Fred, who had the ability to snap his fingers and create a $1,000 bill out of thin air? Obviously, no such person has this power. The Fed, however, does have this power—it can create money “out of thin air.”

How does the Fed create money out of thin air? Think about the answer in this way: You have a checking account, and the Fed has a checking account. Each account has a certain balance (amount in the account). The Fed can take a pencil and increase the balance in its account at will—legally. You, on the other hand, cannot, nor can anyone

These clerks at the Chicago Board of Trade are buying and selling U.S. Treasury bonds. Why does the U.S. Treasury issue bonds?
else. If you decide to pencil in a new balance and then write a check for an amount you don’t have in your checking account, your check bounces and you pay the bank a penalty charge. Fed checks do not bounce. The Fed can, and does, create money at will “out of thin air.”

Let’s return to the example of an open market purchase. Once you have the $10,000 check from the Fed, you take it to your local bank and deposit it in your checking account. The total dollar amount of checking account deposits in the economy is now $10,000 more than before the Fed purchased your government security. Because no other component of the money supply (not currency or traveler’s checks) is less, the overall money supply has increased.

Open market purchase → Money supply rises

Open Market Sales

Suppose the Fed has a government security that it offers to sell you for $10,000. You agree to buy the security. You write out a check to the Fed for $10,000 and give it to the Fed. The Fed, in return, turns the government security over to you. Next, the check is cleared, and a sum of $10,000 is removed from your account in your bank and transferred to the Fed. Once this sum is in the Fed’s possession, it is removed from the economy altogether. It is as if it disappears from the face of the earth. As you might have guessed, the Fed also has the power to make money disappear into thin air.

The total dollar amount of checking account deposits is less than before the Fed sold you a government security. An open market sale reduces the money supply.

Open market sale → Money supply falls

Changing the Discount Rate

The third button the Fed can push to change the money supply is the discount rate button. Suppose bank A wants to borrow $1 million. It could borrow this dollar amount from another bank (say, bank B), or it could borrow the money from the Fed. If bank A borrows the money from bank B, bank B will charge an interest rate for the $1 million loan. The interest rate charged by bank B is called the federal funds rate. If bank A borrows the $1 million from the Fed, the Fed will charge an interest rate, called either the primary credit rate or the discount rate.

Whether bank A borrows from bank B or from the Fed depends on the relationship between the federal funds rate and the discount rate. If the federal funds rate is lower than the discount rate, bank A will borrow

---

**federal funds rate**
The interest rate one bank charges another for a loan.

**discount rate**
The interest rate the Fed charges a bank for a loan.
from bank B instead of from the Fed. (Why pay a higher interest rate if you don’t have to?) If, however, the discount rate is lower than the federal funds rate, bank A will probably borrow from the Fed.

Whether bank A borrows from bank B or from the Fed has important consequences. If bank A borrows from bank B, no new money enters the economy. Bank B simply has $1 million less, and bank A has $1 million more; the total hasn’t changed.

If, however, bank A borrows from the Fed, the Fed creates new money in the process of granting the loan. Here is how it works: the bank asks for a loan, and the Fed grants it by depositing the funds (created out of thin air) into the reserve account of the bank. For example, suppose the bank has $4 million in its reserve account when it asks the Fed for a $1 million loan. The Fed simply changes the reserve account balance to $5 million.

If the Fed lowers its discount rate so that it’s lower than the federal funds rate, and if banks then borrow from the Fed, the money supply will increase.

Lower the discount rate $\rightarrow$ Money supply rises

If the Fed raises its discount rate so that it is higher than the federal funds rate, banks will begin to borrow from each other rather than from the Fed. At some point, though, the banks must repay the funds they borrowed from the Fed in the past (say, funds they borrowed many months ago), when the discount rate was lower. When the banks repay these loans, money is removed from the economy, and the money supply drops. We conclude that if the Fed raises its discount rate relative to the federal funds rate, the money supply will eventually fall.

Raise the discount rate $\rightarrow$ Money supply falls

See Exhibit 10-7 for a review.

## Defining Terms

1. Define:
   a. discount rate
   b. federal funds rate
   c. open market operation

## Reviewing Facts and Concepts

2. The Fed wants to increase the money supply.
   a. What can it do to the reserve requirement?
   b. What type of open market operation can it conduct?
   c. What can it do to the discount rate?

## Critical Thinking

3. The Fed conducts an open market sale. Does the money for which it sells the government securities stay in the economy? Explain your answer.

## Applying Economic Concepts

4. When the Fed conducts an open market purchase, it buys government securities. As a result, the money supply rises. Could the Fed raise the money supply by buying something other than government securities?

5. If the Fed wants the money supply to rise by a ridiculously high percentage—say, 1 million percent—could it accomplish this objective? Explain your answer.

### Exhibit 10-7 Fed Monetary Tools and Their Effects on the Money Supply

<table>
<thead>
<tr>
<th>Fed Monetary Tool</th>
<th>Money Supply Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Market Operation</td>
<td></td>
</tr>
<tr>
<td>Buys government securities</td>
<td>Increases</td>
</tr>
<tr>
<td>Sells government securities</td>
<td>Decreases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reserve Requirement</th>
<th>Money Supply Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raises reserve requirement</td>
<td>Decreases</td>
</tr>
<tr>
<td>Lowers reserve requirement</td>
<td>Increases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discount Rate</th>
<th>Money Supply Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowers discount rate (relative to the federal funds rate)</td>
<td>Increases</td>
</tr>
<tr>
<td>Raises discount rate (relative to the federal funds rate)</td>
<td>Decreases</td>
</tr>
</tbody>
</table>

This table summarizes the ways in which the Fed can change the money supply.
Chapter Summary

Be sure you know and remember the following key points from the chapter sections.

Section 1
- Transaction costs—the time and effort required in an exchange—are high in a barter economy.
- Money is any good that is widely accepted in exchange and in repayment of debts.
- The value of money comes from its general acceptability in exchange.
- Money has three major functions: a medium of exchange, a unit of account, and a store of value.
- Early bankers were goldsmiths who gave the customers a warehouse receipt for the gold they stored with the goldsmith.

Section 2
- The most basic money supply in the United States is called M1 (M-one).
- M1 consists of currency, checking accounts, and traveler’s checks.
- Currency is coins and paper money, or Federal Reserve notes.
- Checking accounts are also known as demand deposits, money deposited that can be withdrawn by writing a check.
- A traveler’s check is issued by a bank in specific denominations and sold to travelers for their use.
- A savings account is considered near-money.
- Credit cards are not money because they cannot be used as repayment of debt.

Section 3
- As a central bank, the Federal Reserve System is the chief monetary authority in the country.
- The Federal Reserve’s main activities include the following: control the money supply, supply the economy with paper money, hold bank reserves, provide check-clearing services, supervise member banks, and act as lender of last resort.

Economics Vocabulary

To reinforce your knowledge of the key terms in this chapter, fill in the following blanks on a separate piece of paper with the appropriate word or phrase.

1. A(n) _____ is an economy in which trades are made in terms of goods and services instead of money.
2. Anything that is generally accepted in exchange for goods and services is a(n) _____.
3. A banking arrangement in which banks hold only a fraction of their deposits and lend out the remainder is referred to as _____.
4. The _____ is composed of currency, checking accounts, and traveler’s checks.
5. When the Fed buys or sells government securities, it is conducting a(n) _____.
6. The governing body of the Federal Reserve System is the _____.
7. Total reserves minus required reserves equals _____.
8. _____ are the minimum amount of reserves a bank must hold against its checking account deposits, as mandated by the Fed.
9. The interest rate that one bank charges another bank for a loan is called the _____.
10. The interest rate that the Fed charges a bank for a loan is called the _____.

Understanding the Main Ideas

Write answers to the following questions to review the main ideas in this chapter.

1. A person goes into a store and buys a pair of shoes with money. Is money here principally functioning as a medium of exchange, a store of value, or a unit of account?
2. Explain how money emerged out of a barter economy.
3. Why is a checking account sometimes called a demand deposit?
4. What is currency?
5. Explain how a check clears. Illustrate this process using two banks in the Federal Reserve district in which you live.
6. List the locations of the 12 Federal Reserve district banks.
7. State what each of the following equals:
   a. total reserves
   b. required reserves
   c. excess reserves
8. Determine which of the following Fed actions will increase the money supply: (a) lowering the reserve requirement, (b) raising the reserve requirement, (c) conducting an open market purchase, (d) conducting an open market sale, (e) lowering the discount rate relative to the federal funds rate, (f) raising the discount rate relative to the federal funds rate.
9. What do we mean when we say that the Fed can create money “out of thin air”?
10. Explain how an open market purchase increases the money supply.
11. What is the relationship between changes in the reserve requirement and changes in the money supply?
12. Suppose the Fed sets the discount rate much higher than the existing federal funds rate. With this action, what signal is the Fed sending to banks?

Doing the Math
Do the calculations necessary to solve the following problems.

1. A tiny economy has the following money in circulation: 25 dimes, 10 nickels, 100 one-dollar bills, 200 five-dollar bills, and 40 twenty-dollar bills. In addition, traveler’s checks equal $500, balances in checking accounts equal $1,900, and balances in savings accounts equal $2,200. What is the money supply? Explain your answer.
2. A bank has $100 million in its reserve account at the Fed and $10 million in vault cash. The reserve requirement is 10 percent. What do total reserves equal?
3. The Fed conducts an open market purchase and increases the reserves of bank A by $2 million. The reserve requirement is 20 percent. By how much does the money supply increase?

Working with Graphs and Tables

1. In Exhibit 10-8, fill in the blanks (a), (b), and (c).

| Fed buys government securities | Money supply (a) |
| Fed raises reserve requirement | Money supply (b) |
| Fed raises the discount rate (relative to federal funds rate) | Money supply (c) |

Solving Economic Problems
Use your thinking skills and the information you learned in this chapter to find solutions to the following problems.

1. Cause and Effect. In year 1, reserves equal $100 billion, and the money supply equals $1,000 billion. In year 2, reserves equal $120 billion, and the money supply equals $1,200 billion. Did the greater money supply in year 2 cause the higher dollar amount of reserves, or did the higher dollar amount of reserves cause the greater money supply? Explain.

2. Writing. Write a one-page paper about something you enjoy that would not exist in a barter economy. Explain why it would not exist.