INTRODUCTION

Ask someone what he or she thinks “finance” is about. You’ll probably get a variety of responses: “It deals with money.” “It is what my bank does.” “The New York Stock Exchange has something to do with it.” “It’s how businesses and people get the money they need—you know, borrowing and stuff like that.” And they’ll all be correct!

Finance is a broad field. It involves national and international systems of banking and financing business. It also deals with the process you go through to get a car loan and what a business does when planning for its future needs.

Within the general field of finance, there are three areas of study—financial institutions and markets, investments, and financial management. These areas are illustrated in the accompanying diagram. Financial institutions collect funds from savers and lend them to or invest them in businesses or people that need cash. Examples of financial institutions are commercial banks, investment banks, insurance companies, and mutual funds. Financial institutions operate as part of the financial system. The financial system is the environment of finance. It includes the laws and regulations that affect financial transactions. The financial system encompasses the Federal Reserve System, which controls the supply of money in the U.S. economy. It also consists of the mechanisms that have been constructed to facilitate the flow of money and financial securities among countries. Financial markets represent ways for bringing together those that have money to invest with those that need funds. Financial markets, which include markets for mortgages, securities, and currencies, are necessary for a financial system to operate efficiently. Part 1 of this book examines the financial system and the role of financial institutions and financial markets in it.

Securities markets play important roles in helping businesses and governments raise new funds. Securities markets also facilitate the transfer of securities between investors. A securities market can be a central location for the trading of financial claims, such as the New York Stock Exchange. It may also take the form of a communications network, as with the over-the-counter market, which is another means by which stocks and bonds can be traded. When people invest funds, lend or borrow money, or buy or sell shares of a company’s stock, they are participating in the financial markets. Part 2 of this book examines the role of securities markets and the process of investing in bonds and stocks.

The third area of the field of finance is financial management. Financial management studies how a business should manage its assets, liabilities, and equity to produce a good or service. Whether or not a firm offers a new product or expands production, or how it invests excess cash are examples of decisions that financial managers are involved with. Financial managers are constantly working with financial institutions and watching financial market trends as they make investment and financing decisions. Part 3 discusses how financial concepts can help managers better manage their firms.
It is important to recognize that there are few clear distinctions or separations between the three areas of finance. The diagram intentionally shows institutions and markets, investments, and financial management overlapping with each other. Financial institutions operate in the environment of the financial markets and work to meet the financial needs of individuals and businesses. Financial managers do analyses and make decisions based on information they obtain from the financial markets. They also work with financial institutions when they need to raise funds and when they have excess funds to invest. Participants investing in the financial markets use information from financial institutions and firms to evaluate different investments in securities such as stocks, bonds, and certificates of deposit. A person working in one field must be knowledgeable about all three. Thus, this book is designed to provide you with a survey of all three areas of finance.

Part 1, Institutions and Markets, presents an overview of the financial system and its important components of policy makers, a monetary system, financial institutions, and financial markets. Financial institutions operate within the financial system to facilitate the work of the financial markets. For example, you can put your savings in a bank and earn interest. But your money just doesn’t sit in the bank. The bank takes your deposit and the money from other depositors and lends it to Kathy who needs a short-term loan for her business, to Ron for a college loan, and to Roger and Maria who borrow the money to help buy a house. Banks bring together savers and those who need money, such as Kathy, Ron, Roger, and Maria. The interest rate the depositors earn and the interest rate that borrowers pay are determined by national and even international economic forces. Just what the bank does with depositors’ money and how it reviews loan applications are determined to some extent by bank regulators and financial market participants, such as the Federal Reserve Board. Decisions by the President and Congress relating to fiscal policies and regulatory laws may also directly impact financial institutions and markets and alter the financial system.

Chapter 2 presents an overview of the role of money in the operation of the U.S. monetary and financial systems, including discussion of how funds are transferred among individuals, firms, and countries. Depository institutions, such as banks and savings and loans, as well as other financial institutions, involved in the financial intermediation process are the topic of Chapter 3. The Federal Reserve System, the U.S. central bank that controls the money supply, is discussed in Chapter 4. Chapter 5 places the previous chapters in perspective, discussing the role of the Federal Reserve and the banking system in helping meet national economic goals for the United States, such as economic growth, low inflation, and stable exchange rates. Part 1 concludes with an explanation of international trade and the topic of international finance in Chapter 6.
Money and the Monetary System

AFTER STUDYING THIS CHAPTER, YOU SHOULD BE ABLE TO:
- Describe the roles of major components of the financial system.
- Describe the three ways in which money is transferred from savers to businesses.
- Explain why depository institutions are an important part of the monetary system.
- Describe the functions of money.
- Give a brief review of the development of money in the United States.
- Briefly define the M1, M2, and M3 definitions of the money supply.
- Explain possible relationships between money supply and economic activity.
- Comment on developments in the international monetary system.

In Chapter 1, we provided a general overview of the financial environment. We also hope that we provided you with a convincing argument as to why you should study finance. You should also know what is required for a financial system to be effective, some of the financial institutions that are important in the financial system, and some of the securities and other financial claims that are traded in the U.S. financial markets. Finally, you should now have some idea of the career opportunities that are available in finance.

As we progress through Part 1, we build on our understanding of the U.S. financial system. Chapter 3 focuses on understanding the importance of depository and other institutions in the financial system. We discuss how your savings are pooled with the savings of other individuals in financial institutions and then are made available to businesses, governments, and other individuals who may want to invest in inventories, highways, or purchase homes. The remaining chapters in Part 1 focus on the Federal Reserve System, the role of policy makers, and how international developments impact on the financial system.

Each of us needs money. While you may feel you need more or less money than your friend, money is necessary for each of us to conduct day-to-day activities. You may have to buy gas for your car or pay for public transportation to school or work. Your may need money for lunch or supplies. You may even want to borrow to purchase a house some day. After reading this chapter you should have a clearer understanding of the functions and types of money available to you.

John Kenneth Galbraith, U.S. economist, said the following about money:

Money is a singular thing. It ranks with love as man’s greatest source of joy. And with death as his greatest source of anxiety. Over all history it has oppressed nearly all people in one of two ways: either it has been abundant and very unreliable, or reliable and very scarce.
Why should any “thing” be so important? Money is what makes the financial system work. Money is a measure of wealth. Money can be used to purchase goods and services. Money is acceptable to repay debts. Creating and transferring money are integral parts of the capital formation process. However, too much money in an economy is associated with unsustainable economic growth and rapidly rising prices. On the other hand, too little money in an economy is associated with poor economic performance and sometimes recession.

**REVIEW OF THE FINANCIAL SYSTEM**

In Chapter 1 we presented an overview of the U.S. financial system. Figure 2.1 provides a more comprehensive graphic overview of the financial system that will serve as a “road map” of the topics and materials we will be addressing in Part 1. There are four important components to the financial system—government and private policy makers, a monetary system, financial institutions, and financial markets. Public policy makers, Congress, and the President pass laws and set fiscal policy relating to the source and amount of tax revenues and the amount and type of government expenditures. Independent policy makers, the Federal Reserve Board
of Governors, control the money supply and influence interest rates. We discuss how fiscal and monetary policies are administered to achieve economic goals in Chapter 5.

Financial institutions are needed to carry out the financial functions of accumulating and lending or investing savings. Banks play an important financial intermediation role in getting the savings of individuals into the hands of businesses desiring those funds. Insurance companies provide protection against financial loss in the event of premature death or the destruction of real property. Pension funds help individuals save for their retirement years. There is usually a period of time between when insurance companies and pension plans collect premiums and investment contributions and when these funds are disbursed. During this period these financial institutions lend to businesses and governments and invest in corporations. Finance companies provide loans to businesses and individuals. Mortgage companies play an important role in helping individuals find mortgage loans needed to purchase loans.

An effective financial system must also provide for the marketing and transferring of financial assets or claims between investors. While some securities firms such as mutual funds focus on getting savings invested in corporations and government units, other securities firms, like brokerage firms and investment banking firms, play important roles in the marketing of new securities and the transferring of existing securities between investors. Financial markets are important to businesses and governments when they raise new funds, as well as to individuals seeking mortgage loans. Financial markets also facilitate the transfer of existing securities, mortgages, and other financial assets or claims among individuals, businesses, and governments.

Of course, a financial system with policy makers, financial institutions, and financial markets will not function effectively unless there is an accepted measure of wealth, money, and ways to create and transfer money. To do this requires a monetary system comprised of a central bank and a banking system.

OVERVIEW OF THE MONETARY SYSTEM

The monetary system is responsible for carrying out the financial functions of creating and transferring money. Money is needed to conduct day-to-day activities, facilitate the capital investment process, and support economic growth. To understand the monetary system requires a basic understanding of the savings-investment process involving the flow of funds from individual savers to businesses that want to invest in inventories, buildings, and equipment.

SAVINGS-INVESTMENT PROCESS

The savings-investment process involves the direct or indirect transfer of individual savings to business firms in exchange for their securities. Of course, a broader view of the savings-investment process would include the exchange of pooled individual savings for financial claims in the form of mortgage and other loans to individuals wanting to buy houses or make other purchases. A broader savings-investment process would include using pooled individual savings to purchase and hold debt securities issued by governmental units. However, our primary focus throughout this book is on the savings-investment process involving businesses. Figure 2.2 shows three ways whereby money is transferred from savers to a business firm. As illustrated in the top part, savers can directly pur-
purchase the securities (stocks or debt instruments) of a business firm by exchanging money for the firm’s securities. No type of financial institution is used in this type of savings-investment transaction since it involves only a saver and the business firm.

The use of indirect transfers is the more common way by which money is transferred from savers to investors. The middle part of Figure 2.2 shows how the transfer process usually takes place when savers purchase “new” securities issued by a business. From Chapter 1 you should recall that this indirect transfer involves use of the primary securities market. In this process, investment banking firms operate to bring savers and security issuers together. Savers provide money to purchase the business firm’s securities. However, rather than a direct transfer taking place, investment banking firms often first purchase the securities from the issuing firm and then resell the securities to the savers. However, no additional securities are created in this type of indirect transfer.

The bottom part of Figure 2.2 illustrates the typical capital formation process involving a financial institution. Savers deposit or invest money with a financial institution such as a bank, insurance company, or mutual fund. The financial intermediary issues its own securities to the saver. For example, a saver may give money in the form of currency to a bank in exchange for the bank’s certificate of deposit (CD). The bank, in turn, may lend money to a business firm in exchange for that firm’s “I Owe You” (IOU) in the form of a loan. As money passes from savers through a financial institution to a business firm, a debt instrument or security is created by the financial institution and by the business firm. This is the process of financial intermediation that we discussed in Chapter 1. We will discuss the characteristics of the savings-investment process in greater detail in Chapter 7 when we begin Part 2 (investments) of this book.
PARTICIPANTS IN THE U.S. MONETARY SYSTEM

An effective monetary system must be able to create and transfer money and support capital formation within the financial system. Figure 2.3 indicates the major participants in the U.S. monetary system. A central bank is needed to define and regulate the amount of the money supply in the financial system. A central bank also facilitates the transferring of money by processing and clearing “checks,” a form of money called deposit money. The central bank in the United States is called the Federal Reserve System (or Fed for short). We will discuss the characteristics and operation of the Fed in Chapter 4 and cover its policy-making activities in Chapter 5.

An efficient banking system also is needed. Not all types of financial institutions are the same. For example, while insurance companies and investment companies can provide a financial intermediation function between savers and investors, only depository institutions as a “group” can create money. Recall from Chapter 1 that depository institutions include commercial banks, S&Ls, savings banks, and credit unions. For purposes of presentation, it is common practice to refer to all depository institutions as “banks” and they all are part of the “banking” system. We discuss the characteristics of depository and other major financial institutions in Chapter 3.

In Figure 2.3 shading is used to depict the banking system as comprising all the banks in the system. For illustration purposes, there is a first bank and a last bank. The banking system creates money (technically deposit money) and, along with the

FIGURE 2.3
The U.S. Monetary System
Fed, clears checks and transfers money within the overall financial system. Checks
can be cleared either through other banks in the banking system or with the aid of
the Fed. We will examine the check-clearing process in Chapters 3 and 4.

While an individual bank, such as the First Bank, cannot create money, the bank-
ing system can. Let’s assume that the First Bank receives $1,000 from the ABC
business firm and sets up a checking account (demand deposit) for the firm. The
$1,000 received by First Bank is called “reserves” and represents money held by First
Bank so that it can pay off checks written by the ABC business firm against its
checking account balance. However, rather than holding the full $1,000 in reserves,
the First Bank will only hold a fraction (e.g., 20%, or $200) in reserves and will lend
out the remaining $800 to the XYZ firm. As long as the XYZ firm places the $800
loan proceeds in its checking account at a bank (e.g., Last Bank) somewhere in the
banking system, the initial $1,000 demand deposit established for the ABC firm has
increased to $1,800 (the $1,000 for ABC plus the $800 for XYZ). Thus, as long as
deposit money keeps coming back into the banking system, more deposit money is
created. We will explore the deposit money creation process in greater detail in
Chapter 5 when we discuss the Fed’s monetary policy making activities.

FUNCTIONS OF MONEY

Money is anything generally accepted as a means of paying for goods and services
and for paying off debts. For something to serve successfully as money, it must be:
easily divisible, so that exchanges can take place in small or large quantities; rela-
tively inexpensive to store and transfer; and reasonably stable in value over time.
Money must perform three basic functions. Money must serve as a “medium of ex-
change,” “store of value,” and “standard of value.”

Money was first developed to serve as a medium of exchange to facilitate trans-
actions. Primitive economies consisted largely of self-sufficient units or groups that
lived by means of hunting, fishing, and simple agriculture. There was little need or
occasion to exchange goods or services. As economies became more developed,
however, the process of exchange became important. Some individuals specialized,
to a degree at least, in herding sheep, raising grain, or making gold as metalsmith.
To aid exchanges of goods for goods, called barter, tables of relative values were
developed from past experience. For example, a table might show the number of
furs, measures of grain, or amount of cloth agreed to equal one cow. This arrange-
ment eased exchanges, but the process still had many serious drawbacks. For exam-
ple, if a person had a cow and wanted to trade it for some nuts and furs, he or she
would need to find someone who had an excess of both these items to trade. The
need for a simpler means of exchange led to the development of money, with its
relatively low storage and transfer costs, to be used as a medium of exchange.

Money also may be held as a store of value. That is, money may be spent immedi-
ately after it is received or after it has been held for some time. Whether money is held,
it is a liquid asset and provides its owner with flexibility. But the owner pays for this
flexibility by giving up the potential return that could be earned through investment
or the satisfaction that could be gained from spending it for goods and services.
Money can perform its function as a store of value only if its “purchasing power” is rel-
avely stable over time. Under this condition, the spending decision is separated from
the income decision. Once income is received, the holder of the income can choose to

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1As we will see, deposit money can theoretically continue to increase until the total “held” reserves
equal the initial deposit. In practice, the Fed establishes the percentage of reserves that must be held
against demand deposits.
“spend it” or “save it.” If the decision is to save, then that money can be made available through the savings-investment process to those who may want to invest now.

Any asset other than money can also serve as a store of value as long as that asset can be converted into money quickly and without significant loss of value. We refer to this quality—the ease with which an asset can be exchanged for money or other assets—as liquidity. Money is perfectly liquid since it is a generally accepted medium of exchange. Other assets, such as savings deposits held at depository institutions, approach the liquidity of money. The existence of such liquid assets reduces the need for holding money itself as a store of value.

Money also serves as a standard of value, which means that prices and contracts for deferred payments are expressed in terms of the monetary unit. For example, in the United States, prices and debts are usually expressed in terms of dollars without stating whether the purchase will be cash or credit. Of course, if money is to perform its function as a standard of value, it is essential that the value of the monetary unit be relatively stable over time. For example, if one dollar can be used to purchase two ballpoint pens today but only one tomorrow, such money would not be very effective as either a store of value or a standard of value.

While money is the fundamental measure of wealth, an individual’s net worth usually consists of more than just money. Individual net worth is the sum of an individual’s money, real assets, and financial assets or claims against others less the individual’s debt obligations. Recall that real assets include the automobile that you own, your house (if you have one) and its contents, clothes, and even jewelry or precious stones. You may also own shares of stock in a mutual fund. While this is a financial asset, it is still part of your net worth. However, you may have borrowed from a bank to purchase your auto and you probably have a mortgage loan on the house you purchased. These are financial claims held by others against some of your real property. You must subtract debt obligations or financial claims against you or your real property in order to determine your individual net worth. It has been estimated that there are about 7 million millionaires in the world, most of them in the United States. If you wish to join this group some day, you will have to accumulate a net worth in excess of $1 million. Good luck!

**CONCEPT CHECK**

What are the three functions performed by money?

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**SMALL BUSINESS PRACTICE**

Where Should You Start Your Small Business?

Today, with modern telecommunication facilities and the Internet, many small businesses can be located wherever their owners want to live and work. At the same time, certain cities and areas in the United States seem to be more conducive to helping small businesses succeed.

Each year the Dun & Bradstreet Company (www.dnb.com) “scores” cities to determine which ones provide the best climate and support for small businesses. Five categories are evaluated. First, the “local government attitude toward business” is evaluated in terms of local corporate tax rates and other factors. Second, “local business performance” is assessed in terms of business failure rates and debt payment delinquencies. Third, “local economic growth” is evaluated based on growth in employment and in average wages. The fourth category assesses firm “risk” reflected in the likelihood that the firm will fail. This is based on the firm’s payment record, operating history, and financial health. The fifth category examines “affordability,” as indicated by changes in a cost of living index as well as how wages are growing.

Several factors were found to be common across many of the top cities on the Dun & Bradstreet (D&B) list. Many cities housed strong high-technology and telecommunications firms. Venture capital investments were growing in many of these cities, indicating confidence in local entrepreneurs. Also, top cities often offered innovative small-business programs designed to help entrepreneurs and other small business obtain financial capital. If, or when, you decide to start your own business, you might consider locating in one of the cities designated as best for small business by D&B.

THE DEVELOPMENT OF MONEY IN THE UNITED STATES

The two basic components of money supply in the United States are physical (coin and currency) money and deposit money. A review of the development of money in the United States will help us understand the characteristics of money today, as well as how well U.S. money performs the three functions of money listed.

PHYSICAL MONEY (COIN AND PAPER CURRENCY)

The first function of “successful” money is that it serves as a medium of exchange. Physical money is the coin and paper currency used to purchase goods and services and to settle debts. We will first examine how U.S. coins have changed in terms of their precious metal (gold and silver) content over time. Then, we will examine how U.S. paper currency has changed in terms of both its physical characteristics and “backing” with precious metals.

U.S. Coins

While barter was undoubtedly important in early American history, the government moved swiftly toward a monetary system based on precious metals that would serve as an efficient “medium of exchange.” During much of the seventeenth and eighteenth centuries, the “American” colonies relied primarily on the Spanish dollar to conduct business transactions. In 1785 the word “dollar” was adopted by the U.S. Congress as the standard monetary unit or “standard of value.” The first monetary act in the United States was passed in 1792 and provided for a bimetallic standard based on both gold and silver. The dollar was defined in both grains of pure silver and grains of pure gold. All gold and silver coins were to be full-bodied money because their metal content was worth the same as their face values. For example, one silver dollar was to contain one dollar’s worth of silver, a ten-dollar gold coin was to contain ten dollars’ worth of gold, and so on.

A law passed in 1837 modified the weight for the silver dollar to 412.5 grains of silver with .900 fineness. Copper of .100 was used to make the coins last longer. The result was that each dollar contained .77344 ounces of pure silver. Since the value of the silver content was to be $1, silver was valued at $1.29 per ounce ($1/.77344). The top portion of Figure 2.4 shows the front side (obverse) of two full-bodied U.S. coins. The peace-type dollar was produced during the 1921–1935 period. The Franklin half-dollar, produced during the 1948–1963 period, contained .36169 ounces of pure silver. Since silver prices had been gradually rising, the Franklin half-dollar was full-bodied money at a silver price of $1.38 ($0.50/.36169). Thus, depending on the then-prevailing current market price of silver, a silver coin such as the half-dollar could be less than, greater than, or exactly full-bodied.

For full-bodied money, its “store of value,” was reflected in the then-current value of its precious metal content. And, as long as the price of precious metals moved in unison with the prices of goods and services, this money’s store of value reflected the store of purchasing power.

Rapidly rising silver prices in the 1960s, however, made silver coins worth more as melted-down bullion than their face values. As a result, the U.S. government

INTERNET ACTIVITY

Go to the Federal Reserve Bank of San Francisco website at www.frbsf.org. Find information about the history of U.S. paper money and write a brief summary of your findings.
“debased” its full-bodied money by replacing silver content with copper and nickel. Coins with face values higher than the value of their metal content are called **token coins**. The bottom portion of Figure 2.4 shows two copper-nickel clad (token) U.S. coins. The Eisenhower dollar was minted during the 1971–1978 period. Kennedy half-dollars were full-bodied coins in 1964, changed to silver-clad (reduced silver content) coins during the 1965–1970 period, and became copper-nickel–clad coins beginning in 1971 and continuing today.

The production of gold coins began in 1795 with the $5 and $10 coins. The issuance of full-bodied gold “dollars” was authorized in 1849 and production continued through 1889. Thus, for several decades, the value of a U.S. “dollar” was expressed both in terms of silver and gold. All gold coin production was stopped in 1933, and in 1934 U.S. citizens were prohibited from holding monetary gold in the United States. This restriction was extended to gold held abroad by U.S. citizens in 1961. All restrictions on holding gold in money form were removed in 1975.
CHAPTER TWO  O  Money and the Monetary System

Paper Currency
The evolution and use of paper currency in the United States have been characterized by a very erratic history. While some paper money was issued by individual “colonies” in colonial times, the first effort of a “government” to issue paper money occurred when the Continental Congress authorized the issuance of notes called “Continentals” to finance the Revolutionary War. While these notes were denominated in “dollars,” they had no backing in either silver or gold. Rather, they were backed only by possible future tax revenues “when” the colonies became independent. As you might guess, the Continentals soon became worthless. This led to a long period of distrust of paper money. After a brief experience with two national banks, American banking went through a period of no federal regulation and nonuniformity in operating laws. State-chartered banks issued their own paper currency almost at will and in many cases with no or little backing of their notes with gold or silver deposits.3

Paper money may be either representative full-bodied money or fiat money. Representative full-bodied money is paper money that is backed by an amount of precious metal equal in value to the face amount of the paper money. The U.S. government has issued two types of representative full-bodied money. Gold certificates were issued from 1865 through 1928. Since they could be redeemed for gold with a value equal to the paper currency's face amount, they were “as good as gold.” However, since most gold certificates were issued in large denominations, they were not intended to be used in general circulation but rather to settle institutional gold accounts. The issuance of silver certificates was authorized beginning in 1878. A switch to “small-size” silver certificates occurred in 1929 and they continued to be issued and used through 1963. The top portion of Figure 2.5 shows an example of a silver certificate. These certificates could be exchanged for silver dollars or silver bullion when presented to the U.S. Treasury. Of course, like full-bodied silver coins, these silver certificates became worth more in terms of the bullion value of silver relative to their face values as silver prices began climbing in the 1960s. As a result, redemption of silver certificates in silver dollars was halted in 1964 by the U.S. government and in 1968 redemption in silver bullion also was stopped.

Today, almost all paper money in circulation is in the form of Federal Reserve Notes, which were authorized under the Federal Reserve Act of 1913. The bottom portion of Figure 2.5 shows an example of a Federal Reserve Note. These notes, which are not backed by either gold or silver, are called fiat money because the government decreed the notes to be “legal tender” for purposes of making payments and discharging public and private debts. Of course, the copper-nickel clad, or token, coins of today are also fiat money because their metal content values are less than their face values.

The reliance on the use of fiat money can be problematic. First, fiat money generally becomes worthless if the issuing government fails. As an example, Confederate currency was issued during the U.S. Civil War. However, when the Confederacy lost the war, this fiat money became worthless. Second, since there is no required backing in gold or silver, it is relatively easy to issue more and more fiat money. Too much money can, in turn, lead to rising prices and a lack of confidence in the government. Thus, an effective monetary system with a strong central bank and prudent policy makers are needed when a financial system relies on fiat money to carry out its transactions.

3By 1865, it was estimated that about one-third of the circulating paper currency was counterfeit. As a result, the U.S. Treasury established the U.S. Secret Service to control counterfeiting activities.
Several major changes in Federal Reserve Notes have taken place over time. In 1929, the size of the notes was reduced about 25 percent from large notes (7.42 inches by 3.13 inches) to small notes (6.14 inches by 2.61 inches). This change made production less expensive and made it easier to handle and less costly to store and transfer paper money. A new series of notes that made use of microprinting and an embedded security strip was introduced in 1990 to improve security and to make counterfeiting more difficult. A more complete design began with the $100 “large portrait” bill in 1996. “Large portrait” $50 bills were introduced in 1997 and $20 bills were placed in circulation in 1998. Today only the $1 bill continues to use the “small portrait” format.
The “small portrait” $20 note is shown in the top portion of Figure 2.6 and the “large portrait” $20 bill is at the bottom. Notice that the larger portrait also was placed off-center to allow the inclusion of a watermark that is visible from both sides when held up against a light. The bill also contains a vertically embedded security thread, which glows red when exposed to ultraviolet light, at the far left of the portrait. Color-shifting ink, fine line printing, and microprinting have been added to counter counterfeiting efforts. These anti-counterfeiting efforts help maintain the public’s trust and confidence in fiat money. Of course, it is important to remember that even though the appearance of U.S. paper money may be changing, the government honors all previously issued U.S. paper currency at full face value. There is no requirement or time limit for exchanging old notes for new ones. Thus, old notes continue to remain in circulation until depository institutions return them to the Fed to be retired.

**CONCEPT CHECK**

What is meant by full-bodied money?
What is meant by fiat money?
DEPOSIT MONEY

The use of physical (coin and currency) money to complete transactions can be very costly and inefficient if large amounts and/or long distances are involved. As a result of these constraints on the use of physical money, along with confidence in the banking system, a special type of credit money called deposit money has grown readily in importance in the U.S. monetary system. Credit money is money backed by the “creditworthiness” of the issuer. Deposit money is backed by the creditworthiness of the depository institution that issued the deposit.

Deposit money takes the form of demand deposits held at commercial banks or other checkable deposits held at S&Ls, savings banks, and credit unions. A demand deposit gets its name from the fact that the owner of a deposit account “demands” that all or a portion of the amount in his or her demand deposit account be transferred to another individual or organization. Checks or “drafts” have traditionally been used to transfer demand deposit or other checkable deposit amounts. Let’s return to our earlier example where the ABC business firm deposits $1,000 at the First Bank to set up a $1,000 demand deposit account in ABC’s name. ABC then writes a $1,000 check against its deposit account and sends the check to an equipment manufacturer as payment for purchase of equipment. The equipment manufacturer, upon receiving the check, deposits it in its own demand deposit account held in a bank (e.g., the Last Bank). The check then must be processed and cleared through the banking system, either with or without the assistance of the Fed. That is, it must be returned to the First Bank, which will “pay” the check amount to the Last Bank and deduct $1,000 from the business firm’s demand deposit account at the First Bank.

The processing of “paper checks” is both time-consuming and costly. An alternative is to electronically transfer funds held in demand and other checkable deposit

4Fiat money is a form of credit money. However, while the government declares fiat money to be “legal tender,” other forms of credit money such as deposit money do not have governmental support or backing.
accounts. For example, there is an ongoing increase in the use of automatic transfer service (ATS) accounts that provide for direct deposits to, and payments from, checkable deposit accounts. Employers can have their employees' wages deposited directly in their checking accounts, rather than issuing payroll checks. Individuals can have regular payments such as mortgage payments or insurance premiums automatically deducted from their accounts. Electronic funds transfers by telephone, for payment of utility bills, credit card balances, and so forth, are increasingly common. Debit cards provide for the immediate direct transfer of deposit amounts. For example, when a debit card is used to purchase merchandise at a retailer's "point of sale" cash register, the card holder's bank transfers the designated amount from the purchaser's demand account to the retailer's account. Debit cards also can be used to make cash withdrawals from automatic teller machines (ATMs). When cash is dispersed, the user's demand deposit account's balance is immediately reduced by the amount of the cash withdrawal.

U.S. MONEY SUPPLY TODAY

Now that we have a basic understanding how money developed over time in the United States, it is time to examine how the money supply or "stock" is measured today. Since we are trying to "count" the money supply in the financial system as of a point in time, this can also be viewed as the amount of money "stock" on a particular date. We will start with a narrow definition of the money supply and then consider broader definitions. Figure 2.7 shows several definitions of money supply in use today.

M1 MONEY SUPPLY

As noted, the basic function of money is that it must be acceptable as a "medium of exchange." The M1 definition of the money supply includes only types of money that meet this basic function. More specifically, the M1 money supply consists of currency, traveler's checks, demand deposits, and other checkable deposits at depository institutions. Following are the components of M1 and their relative sizes as of November 2001, as reported in the Federal Reserve Bulletin:

<table>
<thead>
<tr>
<th>M1 COMPONENT</th>
<th>BILLIONS</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency</td>
<td>575.0</td>
<td>49.6</td>
</tr>
<tr>
<td>Traveler's checks</td>
<td>7.8</td>
<td>.7</td>
</tr>
<tr>
<td>Demand deposits</td>
<td>323.8</td>
<td>28.0</td>
</tr>
<tr>
<td>Other checkable deposits</td>
<td>251.4</td>
<td>21.7</td>
</tr>
<tr>
<td><strong>Total M1</strong></td>
<td><strong>1,158.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

All four components are types of credit money. Currency is U.S. physical money in the form of coins and paper currency. The coins are token money and the paper currency is fiat money in the form of Federal Reserve Notes. However, U.S. currency (both coins and paper money) is readily accepted for making payments and retiring debts and thus serves as an important medium of exchange. Currency comprises nearly one-half of the M1 money supply. Traveler's checks, offered by banks and other organizations, promise to pay on demand the face amounts of the checks with their acceptance based on the creditworthiness of the issuer. Since traveler's checks are a widely accepted medium of exchange, they qualify as a component of the M1 money supply. Even so, their relative importance is small, as indicated by the fact that they represent less than 1 percent of the M1 total.
As noted, demand deposits (checking accounts) at commercial banks and other checkable deposits at savings and loan associations, savings banks, and credit unions also are considered to be credit money, since these deposits are backed solely by the creditworthiness of the issuing institutions when “checks” are presented for collection. Demand deposits at commercial banks account for 28 percent of the money supply. Other checkable deposits, which represent almost 22 percent of M1, include automatic transfer service (ATS) accounts and negotiable order of withdrawal (NOW) accounts at depository institutions, credit union share draft accounts, and demand deposits at S&Ls, credit unions, and savings banks.

Taken together, demand deposit and other checkable deposit accounts comprise a little less than one-half of the M1 money supply. This high percentage shows the importance of the banking system and its money-creating function within the monetary system and in terms of the broader U.S. financial system.
Before moving to a broader definition of the money supply, we should point out some of the adjustments or exclusions that take place when estimating the M1 money supply or stock. M1 measures transaction balances. These are sums of money that can be spent without first converting them to some other asset and that are held for anticipated or unanticipated purchases or payments in the immediate future. Essentially, only those amounts that represent the purchasing power of units in the U.S. economy other than the federal government are counted. Specifically excluded from M1 is currency in the vaults of depository institutions or held by the Fed and the U.S. Treasury. Demand deposits owed to depository institutions, the federal government, and foreign banks and governments also are excluded. Adjustment is also made to avoid double-counting checks being processed. The vault cash and deposits belonging to depository institutions do not represent purchasing power and therefore are not money. However, they serve as reserves, an important element of our financial system that will be discussed in the next several chapters.

**M2 MONEY SUPPLY**

The Fed’s second definition of the money stock, M2, is a broader measure than M1 because it emphasizes money as a “store of value” in addition to its function as a medium of exchange. In general terms, the **M2 money supply** includes M1 plus highly liquid financial assets including savings accounts, small time deposits, and retail money market mutual funds. Most of the financial assets added to M2 provide their owners with a higher rate of return than would M1 components. More specifically, M2 adds to M1 savings deposits, money market deposit accounts (MMDAs), and small-denomination time deposits (under $100,000) at depository institutions, plus balances in retail money market mutual funds (MMMFs) where initial investments are less than $50,000.

Figure 2.7 shows that M2 is well over four times the size of M1. Some of the owners of the assets included in M2 hold them as long-term savings instruments. Other individuals and firms hold these M2 specific assets even though they plan to spend the funds within a few days because the assets are very liquid. M1 thus underestimates purchasing power by the amount of these M2 balances held for transaction purposes.

The components of M2 illustrate the difficulties the Fed has faced in drawing the boundaries of these definitions. For example, money market deposit accounts (MMDA) provide check-writing privileges and can therefore be used for transaction purposes. Some analysts argue on this basis that MMDA balances should be a part of M1. The Fed has included MMDA balances in M2 but not in M1 because MMDAs are different from traditional money components and because MMDAs seem to be used more as savings instruments than as transactions balances. On the other hand, it can be argued that small time deposits should be excluded from M2 because they are not, in practice, very liquid. Small time deposit holders, who wish to cash them in before maturity, are penalized by having to forfeit some of the interest they have earned. However, small time deposits are included because they are considered to be close substitutes for some of the other savings instruments included in M2. Savings deposits, including MMDAs, at depository institutions are greater than the M1 total.

**Money market mutual funds (MMMFs)** issue “shares” to customers and invest the proceeds in highly liquid, very short-maturity, interest-bearing debt instruments called money market investments. Thus, MMMFs get their name from the type of investments they make. The nature of their investments coupled with payment of
interest daily keeps MMMF shares valued at $1. Many MMMFs allow shareholders to write checks against their accounts. When checks are “cleared” and presented to the MMMF for payment, the number of shares owned by the shareholder are reduced accordingly. This process, of course, is very similar to writing checks against checkable deposits held with depository institutions. However, rather than including retail MMMF balances in M1, the Fed decided that consumers use the accounts more as a store of purchasing power and less as a medium of exchange. Retail MMMF balances were $1,000 billion in late 2001 and thus are approaching the size of M1.

**M3 MONEY SUPPLY**

M3 takes an even broader view of money as a “store of value.” In general, the M3 money supply includes M2 plus large time deposits and institutional money market mutual funds. Figure 2.7 shows that M3 was about $8,000 billion near the end of 2001. More specifically, M3 includes large time deposits (over $100,000), balances in institutional MMMFs (minimum initial investments of $50,000 or more), repurchase agreements (overnight and term) issued by depository institutions, and Eurodollars (overnight and term) held by U.S. residents in the United Kingdom and Canada and at foreign branches of U.S. banks. A repurchase agreement is essentially a way of making a loan. The lender buys an asset, usually securities, from the borrower, thus providing funds to the borrower. The borrower repays by buying back the asset at a prearranged time and price. Overnight repurchase agreements (RPs) and Eurodollars are repaid the next day. Term RPs and Eurodollars are held for a longer time.

**EXCLUSIONS FROM THE MONEY SUPPLY**

The Fed excludes certain “stores of value” and “borrowings” from its money supply definitions. For example, stock and bond mutual funds held by individuals represent stores of value and some even permit limited check writing against these accounts. However, because the value of “shares” in these funds often fluctuates widely and individuals may hold these “security investments” for a long time, the Fed does not consider these as part of the money supply.

**Credit cards** provide predetermined credit limits to consumers at the time the cards are issued. No checkable or other deposits are established at time of issue. Thus neither credit card limits nor outstanding balances are part of the money supply. Rather, credit cards just allow their holders to “borrow” up to a predetermined limit. However, the use of credit cards can impact on the rate of turnover of the money supply and may contribute to money supply expansion. If credit card “borrowing” stimulates the demand for goods and services, a given money supply can support a higher level of economic activity. We will explore the relationship between money supply and economic activity in the next section. Also, when you use your credit card to purchase a product for, say, $50 at a local retailer, the bank that issued the credit card “loans” you $50 and increases the retailer’s demand deposit account by $50. Thus, as credit card “balances” increase because you purchase goods and services on credit, the checkable deposit accounts of those who sold the goods and services also increase. Of course, users of credit cards must eventually pay off their debt obligations.

**MONEY SUPPLY AND ECONOMIC ACTIVITY**

Economists generally believe that money supply “matters” when trying to “manage” economic activity. They have observed that economic activity, money supply, and the price levels of goods and services generally move together over time. However, economists disagree as to how these relationships are to be explained.
CHAPTER TWO  Money and the Monetary System

The output of goods and services in the economy is referred to as the **gross domestic product (GDP)**. And, since we typically measure output in “current” dollars, we are measuring “nominal” GDP. Some economists called monetarists believe that the amount of money in circulation determines the level of GDP or economic activity. If we divide GDP by the money supply (MS), we get the number of times the money supply “turns over” to produce GDP. Economists refer to the turnover of money as the velocity of money. More specifically, the velocity of money measures the rate of circulation of the money supply. For example, if the annual GDP is $15 million and the MS is $5 million, the velocity of money (VM) is three times (i.e., $15 million/$5 million). In alternative form, we can say that:

\[ MS \times VM = GDP \]  
(2-1)

For our example, we have:

\[ $5 \text{ million} \times 3 = $15 \text{ million} \]

Economists also express nominal GDP as being equal to “real” output (RO) times the price level (PL) of goods and services, or

\[ RO \times PL = GDP \]  
(2-2)

For example, if the real output in the economy is 150,000 “products” and the average price is $100, the GDP is $15 million (i.e., 150,000 \( \times \) $100). Putting these two equations together, we have:

\[ MS \times VM = RO \times PL \]  
(2-3)

An increase in the money supply and/or velocity causes nominal GDP to increase. And, for nominal GDP to increase, real output and/or price levels must increase. For example, let’s assume the money supply increases by 10 percent or $500,000 to $5.5 million while the velocity stays at three times. Nominal GDP will increase to

\[ $5.5 \text{ million} \times 3 = $16.5 \text{ million} \]

And, since GDP equals RO \( \times \) PL, some change in real output or price level (or a combination of the two) needs to take place. One possibility is for real output to increase by 15,000 “products” or units to 165,000 with no change in prices. GDP then would be:

\[ 165,000 \text{ units} \times $100 = $16.5 \text{ million} \]

Monetarists also believe that when the money supply exceeds the amount of money demanded, the public will spend more rapidly, causing real economic activity or prices to rise. A too-rapid rate of growth in the money supply will ultimately result in rising prices or inflation because excess money will be used to bid up the prices of existing goods. Inflation is a rise or increase in the prices of goods and services that is not offset by increases in their quality. Because of the difficulty in measuring changes in “quality,” a more operational definition of inflation is “a continuing rise in prices.” For example, instead of the $1.5 million increase in GDP from $15 million to $16.5 million being due to a 10 percent increase in the money supply, the increase might have been due solely to inflation. Let’s assume that the quantity of “products” sold remains at the original 150,000-unit level but that the average price increases by 10 percent to $110. GDP would be calculated as:

\[ 150,000 \text{ units} \times $110 = $16.5 \text{ million} \]
Of course, there could be almost unlimited combinations of real outputs and price levels, including reducing one of the variables, that could produce the same new GDP.

Other economists, called Keynesians in honor of John Maynard Keynes, believe that a change in the money supply has a less direct relationship with GDP. They argue that a change in money supply first causes a change in interest rate levels, which, in turn, alters the demand for goods and services. For example, an increase in the money supply might cause interest rates to fall (at least initially) because more money is being supplied than is being demanded. Lower interest rates, in turn, will lead to an increase in consumption and/or investment spending, causing the GDP to grow. In contrast, a decrease in the money supply will likely cause interest rates to rise. As a result, the GDP will grow more slowly or even decline depending on how the higher interest rates affect consumption and spending decisions.

As you might guess, it is not possible to say that one group of economists (monetarists or Keynesians) is right and the other is wrong. The ability to identify relationships among GDP, money supply, and price levels has been complicated by the fact that the velocity of money has increased and the various measures of the money supply have grown at different rates. M1 velocity has increased as credit card usage has replaced the more traditional use of currency and deposit money when purchasing goods and services. The velocity of M1 money also has increased as the public has made more use of money market mutual funds and other liquid accounts that serve as “stores of value” relative to their usage of traditional deposit money in demand and other checkable accounts.

The M1 measure of the money supply grew at nearly a double-digit rate during the first part of the 1990s. Many economists thought that such growth might lead to higher inflation. However, over the same time period, M2 and M3 grew much more slowly. The net result, along with other developments in the economy, was a decline in inflation rates measured in terms of changes in consumer prices. Money supply growth remained moderate and inflation low during the last-half of the 1990s and the early part of the 21st century.

However, we must be careful in trying to interpret the near-term impact of changes in the money supply. Decreasing regulation and increasing competition among financial institutions have led to changes in the types of deposit money that individuals use for “medium of exchange” purposes. Likewise, there are ongoing changes in how individuals make use of “near-cash” accounts for “store of value” purposes. Thus, recent changes in growth rates for different definitions of the money supply reflect in part changes in how individuals pay bills and store purchasing power. This is one reason why the Fed simultaneously keeps track of several measures of the money supply. We will explore how the Fed administers monetary policy in our dynamic and complex financial system in Chapters 4 and 5.

INTERNATIONAL MONETARY SYSTEM

The international monetary system was historically tied to the gold standard. An international gold standard was used to conduct most international trade during the latter part of the 1800s and the early part of the 1900s. However, a breakdown

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5If the increase in money supply leads to price level increases (inflation), nominal interest rates that include inflation expectations might actually increase. We will cover the determinants of market interest rates in Chapter 8.
in the gold standard occurred during World War I, and less formal exchange systems continued during the worldwide depression of the 1930s and during World War II.

In 1944 many of the world’s economic powers met at Bretton Woods, New Hampshire. They agreed to an international monetary system tied to the U.S. dollar or gold via fixed or pegged exchange rates. One ounce of gold was set equal to $35. Each participating country then had its currency pegged to either gold or the U.S. dollar. This system of fixed exchange rates became known as the Bretton Woods System and was maintained through 1971.

By early 1973, major currencies were allowed to float against each other, resulting in a flexible or floating exchange rate system. While free market forces are allowed to operate today, central monetary authorities attempt to intervene in exchange markets when they believe that exchange rates between two currencies are harming world trade and the global economy. This actually makes the current international monetary system a managed floating exchange rate system.

Virtually all international transactions now involve the exchange of currencies or checkable deposits denominated in various currencies. Exchanges occur either for goods and services, for financial claims, or for other currencies. The value of one currency relative to another, the **currency exchange rate**, depends on the supply of and demand for each currency relative to the other. The supply of a currency in international markets depends largely on the imports of the issuing country, that is, how much of their currency they spend in world markets. Demand for a currency depends on the amount of exports that currency will buy from the issuing country. Demand also depends on the confidence of market participants in the restraint and stability of the monetary authority issuing the currency. If demand for a particular currency falls relative to its supply, the exchange rate falls and the international purchasing power of that nation’s money supply drops. Domestic inflation, political instability, or an excess of imports over exports can cause one currency to decline relative to another currency. If a currency is widely accepted, the demand for it may be increased by the desire of people worldwide to hold it as an international medium of exchange. Such is the case of the U.S. dollar, which is widely held internationally because of its general acceptance and ability to hold its value. International finance is discussed in detail in Chapter 6.
Q: You’re a trust officer at Fifth Third Bank. What does your job entail?
A: I help companies select, set up, and manage retirement plans for their employees.

Q: If I owned or managed a company, what would you do for me?
A: First, I would take the time to learn about your firm and help you choose the kind of retirement plan that makes sense for your company’s work force, budget, and growth prospects. I would work directly with your upper management to ensure the plan is set up properly. I would then conduct enrollment seminars to help employees understand and hopefully participate in the plan.

Q: So you’re involved during the sales process and afterward.
A: Right. I spend approximately 30% of my time working with prospects. During the sales process I really act more as a consultant than as a true salesperson. The rest of my time is spent working with the approximately forty existing client plans I am responsible for. I am considered the “relationship officer” so I address not only retirement plan issues, but other customer service needs that the client may have. I also spend a considerable amount of time selling the retirement plan to the employees.

Q: What does the employee education entail?
A: Since most of the plans we manage are 401(k) plans that involve employee contributions through payroll deduction, we explain the importance of saving for retirement. We often have to convince people that they can afford to save. We also focus on investment basics. We explain stocks, bonds, and mutual funds and help them select the investment strategy appropriate for their risk tolerance and age.

Q: How did you end up in this job?
A: When I got out of college I looked into several bank training programs. I liked Fifth Third’s because it included two- to three-month “rotations” in different areas of the bank. That’s how I learned about the department I work in now.

Q: What skills help you most in your job?
A: It’s definitely a people-oriented job. I have continual contact with clients, prospects, and employees and also manage a team of people who do all the day-to-day detail work for our clients. People skills and communication skills are very important. Obviously financial and analytical skills are important, but oddly enough, I’ve found that my ability to write has been a big help too. I am constantly sending letters to clients and attorneys and preparing proposals and employee presentation materials. Thinking on your feet and public speaking help too.

Q: You went to Smith, an all-women’s college. Now you work in banking, which historically has been a male-dominated business. Has it been a difficult adjustment?
A: Smith was a great preparation for the business world. At Smith all of the student leadership positions are held by women. Smith gave me the self-confidence to assert myself and move forward. I wasn’t afraid to take responsibility and speak my mind when I got to Fifth Third because that was standard procedure at Smith.
Although our focus is on the U.S. monetary system, today we operate in a global economy. Thus we must interact with other monetary systems, and a change in either the Japanese or British monetary systems will directly impact the U.S. monetary system. For example, when the Bank of England acts to increase interest rates in Great Britain, the value of the U.S. dollar weakens relative to the British pound. This increases the cost of products imported into the United States unless the Federal Reserve takes countering actions.

SUMMARY
A working knowledge of the U.S. monetary system is essential to understanding the broader U.S. financial system and how businesses and financial institutions operate within the financial system. The monetary system is responsible for creating and transferring money and is intertwined with the savings-investment process. Major participants in the monetary system in the United States include a central bank called the Federal Reserve and a banking system comprised of depository institutions. Money must provide several functions for a monetary system to be successful. Money must serve as a medium of exchange, a store of value, and as a standard of value.

Prior to the development of money, barter was used to exchange goods and services. The American colonies moved quickly to “money” based on precious metals (gold and silver) to conduct transactions. Early U.S. coins were full-bodied money in that the value of their precious metal content was equal to their face. Today, U.S. coins are token coins in that they are no longer backed by precious metals but are backed only by the creditworthiness of the U.S. government. For some time, the government issued gold certificate notes and silver certificate notes that were termed representative full-bodied money because they could be exchanged for precious metals worth the same as the face value of the notes. Today, U.S. paper currency is fiat money, which gets its name from the government decreeing that the notes are “legal tender” for paying public and private debts. Deposit money is demand deposit and other checkable deposit balances held at depository institutions and backed by the creditworthiness of the issuing institutions.

As the U.S. monetary system became more complex, definitions of the money supply changed as forms of payment increased to meet the needs of the economy. Today, the money supply is measured in terms of M1, M2, and M3, which add a variety of liquid assets to more traditional measures of the supply of money. M1 focuses on currency and deposit money that serve primarily as “ mediums of exchange.” M2 and M3 add types of “money” that are viewed more as “stores of value,” such as money market mutual funds.

Economists believe that there is a link between money supply and economic activity. Monetarists contend that there is a direct link between the money supply and gross domestic product (GDP) via the velocity of money. Keynesians believe the link is less direct because changes in money supply impacts first on interest rates which, in turn, influence GDP through changes in consumption and investment. Evidence does not indicate that one group is right and the other wrong. However, by recognizing both views we develop a better understanding of the importance of the role of monetary policy in trying to achieve real economic growth.

Historically, the international monetary system was tied to the gold standard. In 1944 the exchange rates between the currencies of most industrialized countries were fixed relative to the U.S. dollar or gold. However, by the early 1970s exchange rates between major currencies were allowed to float against each other. While we focus on characteristics of the U.S. monetary system, we must recognize that our monetary system does not and cannot operate in isolation from the monetary systems in other countries.

KEY TERMS
automatic transfer service (ATS)  full-bodied money  gross domestic product (GDP)  money
accounts  individual net worth  inflation  money market mutual funds (MMMFs)
barter  liquidity  medium of exchange  representative full-bodied money
bimetallic standard  M1 money supply  M2 money supply  savings-investment process
credit cards  M3 money supply  standard of value  store of value
credit money  token coins  velocity of money
currency exchange rate  debit cards  fiat money

CONCEPT CHECK
What is meant by the currency exchange rate between two countries?
DISCUSSION QUESTIONS

1. Identify the financial system’s major components and their roles.
2. Describe the three basic ways whereby money is transferred from savers to investors.
3. Identify the major participants in the U.S. monetary system.
4. What are the basic functions of money?
5. Describe how an individual’s net worth is determined.
6. Briefly describe the development of money, from barter to the use of precious metals.
7. What is the difference between full-bodied money and token coins?
8. Describe how representative full-bodied money and fiat money differ.
9. What is deposit money and how it is “backed”?
10. What are automatic transfer service (ATS) accounts?
11. What are debit cards and how are they used?
12. Describe the M1 definition of the money supply and indicate the relative significance of the M1 components.
13. How does M2 differ from M1? What are money market mutual funds (MMMFs)?
14. Describe the M3 measure of the money supply.
15. Briefly describe the monetarists’ view of the relationship between money supply and economic activity.
16. How do Keynesians view the relationship between money supply and economic activity?
17. Briefly describe the development of the international monetary system.

EXERCISES

1. Obtain a current issue of the Federal Reserve Bulletin. Compare the present size of M1, M2, and M3 money stock measures with the November 2001 figures presented in Figure 2.7. Also find the current sizes of these M1 components: currency, travelers’ checks, demand deposits, and other checkable deposits. Express each component as a percentage of M1 and compare your percentages with those presented in the U.S. Money Supply Today section of this chapter.
2. Obtain access to several recent issues of Business Week. Review the “Economic Analysis” section for articles relating to developments in the U.S. monetary system. Also examine the “International Business” section for possible developments occurring in foreign monetary systems.

PROBLEMS

1. The following information is available to you: travelers’ checks = $1 million; coin and paper currency = $30 million; repurchase agreements and Eurodollars = $15 million; demand deposits = $25 million; retail money market mutual funds = $60 million; savings accounts at depository institutions = $40 million; checkable deposits at depository institutions = $35 million; large-denomination time deposits = $50 million; institutional money market mutual funds = $65 million; and small-denomination time deposits = $45 million. Using Fed definitions, determine the dollar sizes of the:
   a. M1 money supply
   b. M2 money supply
   c. M3 money supply
2. Assume that a country estimates its M1 money supply at $20 million. A broader measure of the money supply, M2, is $50 million. The country’s gross domestic product (GDP) is $100 million. Production or real output for the country is 500,000 units or “products.”
   a. Determine the velocity of money based on the M1 money supply.
   b. Determine the velocity of money based on the M2 money supply.
   c. Determine the average price for the real output.
3. Using the data in Problem 2 along with the monetarists’ view of the relationship between money supply and GDP, answer the following:
   a. If the M1 money supply increases by 10 percent and the M1 velocity of money does not change, what is the expected value of the GDP for next year?
   b. Based on the information from (a), if real output does not change next year, what is the expected average price for the products? What percentage change, if any, would take place in the price level?
   c. If the M2 money supply decreases by 10 percent and the M2 velocity of money does not change, what is the expected value of GDP next year?
   d. Based on information from (c), if the price level does not change next year, what is the expected real output in units or products?
4. The following information was gathered for the XYZ economy: velocity of money = 3.8 times; average price level = $85; and real output = 10,000 units.
   a. What is the nominal GDP for the XYZ economy?
   b. What is the size of the money supply for the XYZ economy?
c. If real output increases by 10 percent next year, but the price level and velocity of money do not change, what money supply amount will be needed to support this real growth in economic activity?

d. What will be the money supply needed to support economic activity next year if real output increases to 12,000 units, the average price increases to $90, and velocity increases to 4 times?

5. The One Product economy, which produces and sells only personal computers (PCs), expects that it can sell 500 more, or 12,500 PCs next year. Nominal GDP was $20,000,000 this year and the money supply was $7,000,000. The central bank for the One Product economy is planning to increase the money supply by 10 percent next year.

a. What was the average selling price for the personal computers this year?

b. What is the expected average selling price next year for personal computers if the velocity of money remains at this year’s turnover rate? What percentage change in price level is expected to occur?

c. If the objective is to keep the price level the same next year (i.e., no inflation), what percentage increase in the money supply should the central bank plan for?

d. How would your answer in (c) change if the velocity of money is expected to be three times next year? What is it now?

6. Challenge Problem  The following problem requires a basic knowledge about probabilities and the calculation of expected values. In addition, the problem is more easily solved using Excel spreadsheet software.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>.10</td>
<td>.20</td>
<td>.40</td>
<td>.20</td>
<td>.10</td>
</tr>
<tr>
<td>Metric</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Velocity of money</td>
<td>1.75</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td>4.25</td>
</tr>
<tr>
<td>Real output</td>
<td>375</td>
<td>450</td>
<td>500</td>
<td>550</td>
<td>625</td>
</tr>
<tr>
<td>Price level</td>
<td>75</td>
<td>90</td>
<td>100</td>
<td>110</td>
<td>125</td>
</tr>
</tbody>
</table>

a. Calculate the dollar amount of the money supply under each scenario or outcome.

b. Calculate the expected value of the money supply, taking into consideration each scenario and its probability of occurrence.

c. Scenario C is the most likely scenario given that its probability of occurrence is 40 percent. Show how the amount of the money supply would change holding real output at 500,000 units and the price level at $100 for each of the velocity of money turnover rates (you have previously calculated the money supply under Scenario C for a turnover of 3.0 times).

d. Repeat the Scenario C exercise in (c) but now hold the velocity of money at 3.0 times and price level at $100 and allow real output to change.

e. Repeat the Scenario C exercise in (c) but now hold the velocity of money at 3.0 times and real output at 500,000 units and allow price level to change.