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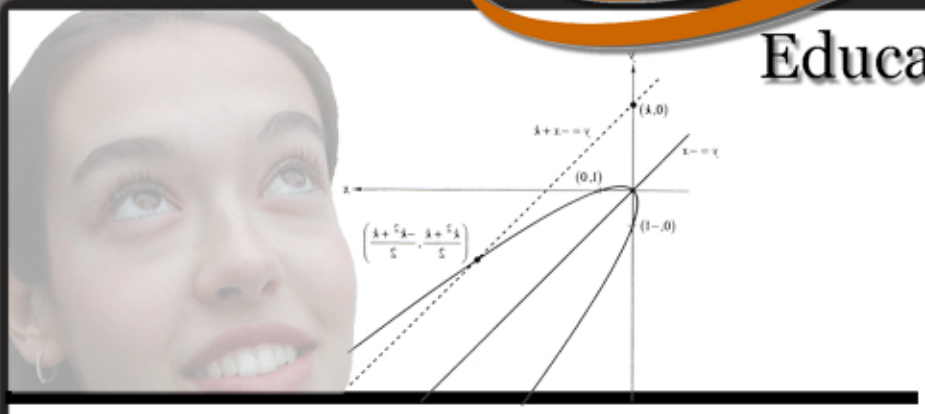

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2 Financial Markets and Interest Rates

"It is better to give than to lend, and it costs about the same."
—Philip Gibbs

Why Interest Rates Are Important to Financial Markets

In April 2006, in a surprise move, China raised its benchmark one-year lending rate from 5.58% to 5.85%.[1]

This seemingly small adjustment had immediate effects on financial markets. Hong Kong's stock market fell 213 points the next day, and Japan's Nikkei 225 fell 208 points.

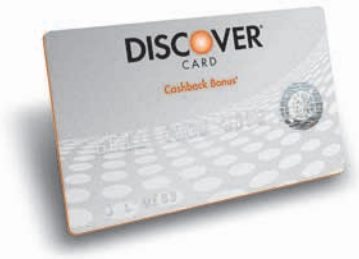
In the U.S., the Federal Reserve chairman suggested that the Fed might hold off on the series of rate increases it had been implementing.[2] This caused a 28-point rise in the Dow Jones Industrial average in the U.S. stock market.

In response to the rate increase in China and the Fed Chairman's comments in the U.S., Hong Kong's Monetary Authority then warned investors of "potential market volatility."

Why is it that financial markets are so sensitive to interest rate changes? Because interest rates represent the cost of borrowed money and when the cost of borrowed money goes up it is harder for businesses to raise funds for expansion. This lowers everyone's expectations for businesses' future growth and this, in turn, causes the value of those businesses (as measured by the prices of their stocks) to fall. No wonder financial markets get jittery when officials start talking about raising interest rates!

[1] *www.Forbes.com*, Apr 28, 2006

[2] *www.businessweek.com*, Apr 27, 2006



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Chapter Overview

One of the central duties of a financial manager is to acquire capital—that is, to raise funds. Few companies are able to fund all their activities solely with funds from internal sources. Most find it necessary at times to seek funding from outside sources. For this reason, all business people need to know about financial markets.

As we see in this chapter, there are a number of financial markets, and each offers a different kind of financial product. In this chapter we discuss the relationship between firms and the financial markets and briefly explain how the financial system works, including the role of *financial intermediaries*—investment bankers, brokers, and dealers. Next, we explore the markets themselves and describe financial products ranging from government bonds to corporate stocks. Finally, we examine interest rates.

Learning Objectives

After reading this chapter, you should be able to:

1. Describe how the U.S. financial system works.
2. Define financial securities.
3. Explain the function of financial intermediaries.
4. Describe the securities traded in the money and capital markets.
5. Identify the determinants of the nominal interest rate.
6. Construct and analyze a yield curve.

The Financial System

In the U.S. economy, several types of individuals or entities generate and spend money. We call these *economic units*. The main types of economic units include governments, businesses, and households (households may be one person or more than one person). Some economic units generate more income than they spend and have funds left over. These are called **surplus economic units**. Other economic units generate less income than they spend and need to acquire additional funds in order to sustain their operations. These are called **deficit economic units**.

Take Note
The words *surplus* and *deficit* do not imply something necessarily good or bad. They simply mean that some economic units need funds, and others have funds available. If Disney needs $2 billion to build a theme park in a year when its income is "only" $1.5 billion, Disney is a deficit economic unit that year. Likewise, if a family earns $40,000 in a year but spends only $36,000, it is a surplus economic unit for that year.

The purpose of the financial system is to bring the two groups—surplus economic units and deficit economic units—together for their mutual benefit.

The financial system also makes it possible for participants to adjust their holdings of financial assets as their needs change. This is the *liquidity function* of the financial system—that is, the system allows funds to flow with ease.

To enable funds to move through the financial system, funds are exchanged for financial products called *securities*. A clear understanding of securities is essential to understanding the financial system, so before we go further, let's examine what securities are and how they are used.

Securities

Securities are documents that represent the right to receive funds in the future. The person or organization that holds a security is called a **bearer**. A security certifies that the bearer has a *claim* to future funds. For example, if you lend $100 to someone and the person gives you an IOU, you have a security. The IOU is your "claim check" for the $100 you are owed. The IOU may also state *when* you are to be paid, which is referred to as the **maturity date** of the security. When the date of payment occurs, we say the security matures.

Securities have value because the bearer has the right to be paid the amount specified, so a bearer who wanted some money right away could sell the security to someone else for cash. Of course, the new bearer could sell the security to someone else too, and so on down the line. When a security is sold to someone else, the security is being *traded*.

Business firms, as well as local, state, and national governments, sell securities to the public to raise money. After the initial sale, investors may sell the securities to other investors. As you might suspect, this can get to be a complicated business. **Financial intermediaries** facilitate this process. Markets are available for the subsequent traders to execute their transactions.

Financial Intermediaries

Financial intermediaries act as the grease that enables the machinery of the financial system to work smoothly. They specialize in certain services that would be difficult for individual participants to perform, such as matching buyers and sellers of securities. Three types of financial intermediaries are investment bankers, brokers, and dealers.

Investment Bankers Institutions called **investment banking firms** exist to help businesses and state and local governments sell their securities to the public.

Investment bankers arrange securities sales on either an *underwriting basis* or a *best efforts basis*. The term **underwriting** refers to the process by which an investment banker (usually in cooperation with other investment banking firms) purchases all the new securities from the issuing company and then resells them to the public.

Investment bankers who underwrite securities face some risk because occasionally an issue is overpriced and can't be sold to the public for the price anticipated by the investment banker. The investment banker has already paid the issuing company or municipality its money up front, and so it must absorb the difference between what it paid the issuer and what the security actually sold for. To alleviate this risk, investment bankers sometimes sell securities on a **best efforts basis**. This means the investment banker will try its best to sell the securities for the desired price, but there are no guarantees. If the securities must be sold for a lower price, the issuer collects less money.

Brokers Brokers—often account representatives for an investment banking firm—handle orders to buy or sell securities. **Brokers** are agents who work on behalf of an investor. When investors call with orders, brokers work on their behalf to find someone to take the other side of the proposed trades. If investors want to buy, brokers find sellers. If investors want to sell, brokers find buyers. Brokers are compensated for their services when the person whom they represent—the investor—pays them a commission on the sale or purchase of securities. Brokers are obligated to find "suitable investments" for their clients. They do not generally have the higher duty that comes when one is acting as a fiduciary. A fiduciary is obligated to put the interests of the principal ahead of all others, including the interests of the fiduciary herself.

Dealers **Dealers** make their living buying securities and reselling them to others. They operate just like car dealers who buy cars from manufacturers for resale to others. Dealers make money by buying securities for one price, called the *bid price,* and selling them for a higher price, called the *ask (or offer) price*. The difference, or spread, between the bid price and the ask price represents the dealer's fee.

Financial Markets

As we have pointed out, the financial system allows surplus economic units to trade with deficit economic units. The trades are carried out in the **financial markets**.

Financial markets are categorized according to the characteristics of the participants and the securities involved. In the *primary market,* for instance, deficit economic units sell new securities directly to surplus economic units and to financial institutions. In the *secondary market,* investors trade previously issued securities among themselves. Primary and secondary markets can be further categorized as to the maturity of the securities traded. Short-term securities—securities with a maturity of one year or less—are traded in the *money market;* and long-term securities—securities with a maturity of more than one year[3]—are traded in the *capital market*. A number of other financial markets exist, but we are mainly concerned with these four. In the following sections, we examine each of these markets in turn.

Take Note

Do not confuse financial markets with financial institutions. A financial market is a forum in which financial securities are traded (it may or may not have a physical location). A financial institution is an organization that takes in funds from some economic units and makes them available to others.

The Primary Market

When a security is created and sold for the first time in the financial marketplace, this transaction takes place in the **primary market**. Morgan Stanley helped Dolby Laboratories sell stock to the public in 2005.[4] This was a primary market transaction. In this market the issuing business or entity sells its securities to investors (the investment banker simply assists with the transaction).

The Secondary Market

Once a security has been issued, it may be traded from one investor to another. The **secondary market** is where previously issued securities—or "used" securities—are traded among investors. Suppose you called your stockbroker to request that she buy 100 shares of stock for you. The shares would usually be purchased from another investor

[3]The distinction between "short term" and "long term" is arbitrarily set at one year or less for the former and more than one year for the latter.

[4]Yes, Dolby Laboratories is the company that makes the Dolby sound systems you listen to so often.

in the secondary market. Secondary market transactions occur thousands of times daily as investors trade securities among themselves. These transactions may occur on an exchange or on the over-the-counter market.

The Money Market

Short-term securities (a maturity of one year or less) are traded in the **money market**. Networks of dealers operate in this market. They use phones and computers to make trades rapidly among themselves and with the issuing entities. The specific securities traded in the money market include Treasury bills, negotiable certificates of deposit, commercial paper, and other short-term debt instruments.

Interactive Module

Go to Downloadable Companion Material, chapter 2. There is additional information there on the New York Stock Exchange. Note how specialists do their jobs and how trades are executed on the NYSE. SuperDot is also explained.

The Capital Market

Long-term securities (maturities over one year) trade in the **capital market**. Federal, state, and local governments, as well as large corporations, raise long-term funds in the capital market. Firms usually invest proceeds from capital market securities sales in long-term assets such as buildings, production equipment, and so on. Initial offerings of securities in the capital market are usually large deals put together by investment bankers, although after the original issue, the securities may be traded quickly and easily among investors. The two most widely recognized securities in the capital market are bonds and stocks.

Security Exchanges

Security exchanges, such as the New York Stock Exchange (NYSE), are organizations that facilitate trading of stocks and bonds among investors. Corporations arrange for their stocks or bonds to be *listed* on an exchange so that investors may trade the company's stocks and bonds at an organized trading location. Corporations list their securities on exchanges because they believe that having their securities traded at such a location will make them easier to trade and, therefore, boost the price. Exchanges accept listings because they earn a fee for their services.

Each exchange-listed stock is traded at a specified location on the trading floor called *the post*. The trading is supervised by specialists who act either as brokers (bringing together buyers and sellers) or as dealers (buying or selling the stock themselves).

Prominent international securities exchanges include the NYSE, the American Stock Exchange (AMEX), and major exchanges in Tokyo, London, Amsterdam, Frankfurt, Paris, Hong Kong, and Mexico.

Interactive Module

Go to Downloadable Companion Material, chapter 2. There is additional information there on Nasdaq. Note how market makers do their jobs and how trades are executed in the Nasdaq market.

The Over-the-Counter (OTC) Market

In contrast to the organized exchanges, which have physical locations, the **over-the-counter** market has no fixed location—or, more correctly, it is everywhere. The over-the-counter market, or OTC, is a network of dealers around the world who maintain inventories of securities for sale and cash for purchasing. Say you wanted to buy a security that is traded OTC. You would call your broker, who would then shop among competing dealers who have the security in their inventory. After locating the dealer with the best price, your broker would buy the security on your behalf.

The largest and best-known OTC market for common stock is called Nasdaq. Nasdaq dealers enter their bid and ask prices in a worldwide computer network. Many securities issued by very small companies are simply bought and sold over the telephone.

Market Efficiency

The term **market efficiency** refers to the ease, speed, and cost of trading securities. In an efficient market, securities can be traded easily, quickly, and at low cost. Markets lacking these qualities are considered inefficient.

The major stock markets are generally efficient because investors can trade thousands of dollars worth of shares in minutes simply by making a phone call or hitting a few computer keys and paying a relatively small commission. In contrast, the real estate market is relatively inefficient because it might take you months to sell a house and you would probably have to pay a real estate agent a large commission to handle the deal.

The more efficient the market, the easier it is for excess funds in the hands of surplus economic units to make their way into the hands of deficit economic units. In an inefficient market, surplus economic units may end up with excess funds that are idle while deficit economic units may not get the funds they need. When this happens, economic activity and job creation will be lower than it could be, and deficit economic units may not be able to achieve their goals because they could not obtain needed funds.

Financial markets help firms and individual investors buy and sell securities efficiently. So far, we have discussed the various markets in which securities are traded. Now let's turn to the securities themselves.

Securities in the Financial Marketplace

Securities are traded in both the money and capital markets. Money market securities include Treasury bills, negotiable certificates of deposit, commercial paper, Eurodollars, and banker's acceptances. Capital market securities include bonds and stock. We describe each of these securities briefly in the following discussion.

Securities in the Money Market

Governments, corporations, and financial institutions that want to raise money for a short time issue money market securities. Buyers of money market securities include governments, corporations, and financial institutions that want to park surplus cash for a short time and other investors who want the ability to alter or cash in their investments quickly.

Money market securities are very liquid; that is, they mature quickly and can be sold for cash quickly and easily. Money market securities also have a low degree of risk because purchasers will only buy them from large, reputable issuers (investors don't want to spend a long time checking the issuers' credit for an investment that may only last a few days). These two characteristics, liquidity and low risk, make money market securities the ideal parking place for temporary excess cash.

Let's take a closer look at the main money market securities.

Treasury Bills Every week the United States Treasury issues billions of dollars of **Treasury bills** (T-bills). These money market securities are issued to finance the federal budget deficit (if any) and to refinance the billions of dollars of previously issued government securities that come due each week. After the T-bills are initially sold by the U.S. government, they are traded actively in the secondary market. At maturity, the government pays the face value of the T-bill.

Treasury bills are considered the benchmark of safety because they have essentially no risk. This is because obligations of the U.S. government are payable in U.S. dollars—and, theoretically, the U.S. government could print up all the dollars it needs to pay off its obligations. Treasury bills are issued in one-month, three-month, and six-month maturities. The U.S. Treasury stopped issuing one-year bills in 2001.

Negotiable Certificates of Deposit You may already be familiar with the certificates of deposit (CDs) that you can purchase from your local bank. They are simply pieces of paper that certify that you have deposited a certain amount of money in the bank, to be paid back on a certain date with interest. Small-denomination consumer CDs are very safe investments and they tend to have low interest rates.

Large-denomination CDs (of $100,000 to $1 million or more), with maturities of two weeks to a year, are **negotiable CDs** because they can be traded in the secondary market after they are initially issued by a financial institution. Large corporations and other institutions buy negotiable CDs when they have cash they wish to invest for a short period of time; they sell negotiable CDs when they want to raise cash quickly.

Commercial Paper **Commercial paper** is a type of short-term promissory note—similar to an IOU—issued by large corporations with strong credit ratings. Commercial paper is *unsecured*. This means the issuing corporation does not pledge any specific assets as collateral that the lender (the one who buys the commercial paper note) can take on a priority basis if the issuing corporation defaults on the note. That is why commercial paper is only issued by financially strong, reliable firms.

Commercial paper is considered to be a safe place to put money for a short period of time. The notes themselves are issued and traded through a network of commercial paper dealers. Most of the buyers are large institutions.

Banker's Acceptances A **banker's acceptance** is a short-term debt instrument that is guaranteed for payment by a commercial bank (the bank "accepts" the responsibility to pay). Banker's acceptances, thus, allow businesses to avoid problems associated with collecting payment from reluctant debtors. They are often used when firms are doing business internationally because they eliminate the worry that the lender will have to travel to a foreign country to collect on a debt.

Securities in the Capital Market

When governments, corporations, and financial institutions want to raise money for a long period of time, they issue capital market securities. In contrast to money market securities, capital market securities are often not as liquid or safe. They are not generally suitable for short-term investments.

The two most prominent capital market securities are bonds and stocks. We'll examine these two securities in some depth now.

Bonds **Bonds** are essentially IOUs that promise to pay their owners a certain amount of money on some specified date in the future—and in most cases, interest payments at regular intervals until maturity. When companies want to borrow money (usually a fairly large amount for a long period of time), they arrange for their investment

bankers to print up the IOUs and sell them to the public at whatever price they can get. In essence, a firm that issues a bond is borrowing the amount that the bond sells for on the open market.

Bond Terminology and Types Although many types of bonds exist, most bonds have three special features: face value, maturity date, and coupon interest.

- *Face value*: The amount that the bond promises to pay its owner at some date in the future is called the bond's **face value**, or **par value**, or **principal**. Bond face values range in multiples of $1,000 all the way up to more than $1 million. Unless otherwise noted, assume that all bonds we discuss from this point forward have a face value of $1,000.
- *Maturity date*: The date on which the issuer is obligated to pay the bondholder the bond's face value.
- *Coupon interest*: The interest payments made to the bond owner during the life of the bond. Some bonds pay coupon interest once a year; many pay it twice a year. Some bonds don't pay any interest at all. These bonds are called **zero-coupon bonds**.

The percentage of face value that the coupon interest payment represents is called the *coupon interest rate*. For example, assuming the face value of the bond was $1,000, a bond owner who received $80 interest payments each year would own a bond paying an 8 percent coupon interest rate:

$$\$80 / \$1{,}000 = .08, \text{ or } 8\%$$

The major types of bonds include Treasury bonds and notes, issued by the federal government; municipal bonds, issued by state and local governments; and corporate bonds, issued by corporations. The significant differences among these types of bonds are described in the following sections.

Treasury Notes and Bonds When the federal government wants to borrow money for periods of more than a year, it issues Treasury notes or Treasury bonds. T-notes have initial maturities from 2, 3, or 10 years. Treasury bonds have maturities greater than 10 years. The U.S. Treasury stopped issuing T-bonds in November 2001 (although some bonds issued prior to that time are still available in the secondary market). In February 2006 the Treasury resumed issuing T-bonds when it auctioned some with a maturity of 30 years. Both T-notes and T-bonds pay interest semiannually, in addition to the principal, which is paid at maturity. T-notes are auctioned by the Treasury every three months to pay off old maturing securities and to raise additional funds to finance the federal government's new deficit spending.

The name originated decades ago when holders of bearer bonds would actually tear off coupons from their bond certificates and mail them to the bond issuer to get their interest payments, hence, the name *coupon interest*. Today, bonds are sold on a "registered" basis, which means the bonds come with the owner's name printed on them. Interest payments are sent directly to the owner.

Although Treasury securities, such as T-notes and T-bonds, are extremely low risk, they are not risk free. Without the congressional authority to print money, the U.S. Treasury cannot legally pay its obligations, including the interest and principal on Treasury securities. In March 2006 President Bush's Treasury Secretary wrote to

Congress, imploring them to immediately raise the $8.2 trillion debt limit to avoid the first-ever U.S. default on its obligations.[5] After some debate, Congress accommodated the administration, putting the new limit at $9 trillion. Had they not done so the situation could conceivably have resulted in a default.

In September 1998, the Treasury began selling securities directly from its Web site at *www.publicdebt.treas.gov*.

Municipal Bonds The bonds issued by state and local governments are known as **municipal bonds** or "munis." Many investors like municipal bonds because their coupon interest payments are free of federal income tax.

Municipal bonds come in two types: general obligation bonds (GOs) and revenue bonds. They differ in where the money comes from to pay them off. General obligation bonds are supposed to be paid off with money raised by the issuer from a variety of different tax revenue sources. Revenue bonds are supposed to be paid off with money generated by the project the bonds were issued to finance—such as using toll bridge fees to pay off the bonds to finance the toll bridge.

Corporate Bonds Corporate bonds are similar to T-bonds and T-notes except they are issued by corporations. Like T-bonds and T-notes, they pay their owner interest during the life of the bond and repay principal at maturity. Unlike T-bonds and T-notes, however, corporate bonds sometimes carry substantial risk of default. As a last resort, the U.S. government can print money to pay off its Treasury bill, note, and bond obligations; but when private corporations run into trouble, they have no such latitude. Corporations' creditors may get paid late or not at all.

Relatively safe bonds are called *investment-grade bonds*. Many financial institutions and money management firms are required to invest only in those corporate bonds that are investment grade. Relatively risky bonds are called *junk bonds*.[6] Junk bonds are generally issued by troubled companies, but they may be issued by financially strong companies that later run into trouble.

This completes our introduction to bonds. Now let's turn our attention to the other major security in the capital market, corporate stock.

Corporate Stock Rather than borrowing money by issuing bonds, a corporation may choose to raise money by selling shares of ownership interest in the company. Those shares of ownership are **stock**. Investors who buy stock are called stockholders.

As a source of funds, stock has an advantage over bonds: The money raised from the sale of stock doesn't ever have to be paid back, and the company doesn't have to make interest payments to the stockholders.

A corporation may issue two types of corporate stock: *common stock* and *preferred stock*. Let's look at their characteristics.

Common Stock Common stock is so called because there is nothing special about it. The holders of a company's common stock are simply the owners of the company. Their ownership entitles them to the firm's earnings that remain after all other groups having a claim on the firm (such as bondholders) have been paid.

[5]Source: *www.CBSnews.com*, March 6, 2006.

[6]The term *junk bond* is a slang term that is now widely accepted. Firms trying to sell junk bonds often dislike the term, of course. They would prefer such bonds be referred to as high yield securities.

Each common stockholder owns a portion of the company represented by the fraction of the whole that the stockholder's shares represent. Thus, if a company issued 1 million shares of common stock, a person who holds one share owns one-millionth of the company.

Common stockholders receive a return on their investment in the form of common stock **dividends**, distributed from the firm's profits, and **capital gains**, realized when they sell the shares.[7]

Preferred Stock Preferred stock is so called because if dividends are declared by the board of directors of a business, they are paid to preferred stockholders first. If any funds are left over, they may be paid to the common stockholders. Preferred stockholders are not owners and normally don't get to vote on how the firm is run as do common stockholders Also, holders of preferred stock have a lower expected return than do holders of common stock because preferred stock is a less risky investment. The party that is paid last, the common stockholder, is taking a greater risk since funds may run out before getting to the end of the line.

Of course, there is no guarantee that a common stockholder's stock will increase in price. If the price goes down, the stockholder will experience a capital loss.

Interest

No one lends money for free. When people lend money to other people, a number of things could happen that might prevent them from getting all their money back. Whenever people agree to take risk, compensation is required before they will voluntarily enter into an agreement. In financial activities, we refer to this compensation as **interest**. Interest represents the return, or compensation, a lender demands before agreeing to lend money. When we refer to interest, we normally express it in percentage terms, called the *interest rate*. Thus, if you lend a person $100 for one year, and the return you require for doing so is $10, we would say that the interest rate you are charging for the loan is $10/$100 = .10, or 10 percent.

Determinants of Interest Rates

The prevailing rate of interest in any situation is called the **nominal interest rate**. In the preceding example, the nominal interest rate for the one-year $100 loan is 10 percent.

The nominal interest rate is actually the total of a number of separate components, as shown in Figure 2-1 on the next page. We will explore each of these components in the following sections.

The Real Rate of Interest Lenders of money must postpone spending during the time the money is loaned. Lenders, then, lose the opportunity to invest their money for that period of time. To compensate for the burden of losing investment opportunities while they postpone their spending, lenders demand, and borrowers pay, a basic rate of return—**the real rate of interest**. The real rate of interest does not include adjustments for any other factors, such as the risk of not getting paid back. We'll describe this in a moment.

[7]Of course, there is no guarantee that a common stockholder's stock will increase in price. If the price goes down, the stockholder will experience a capital loss.

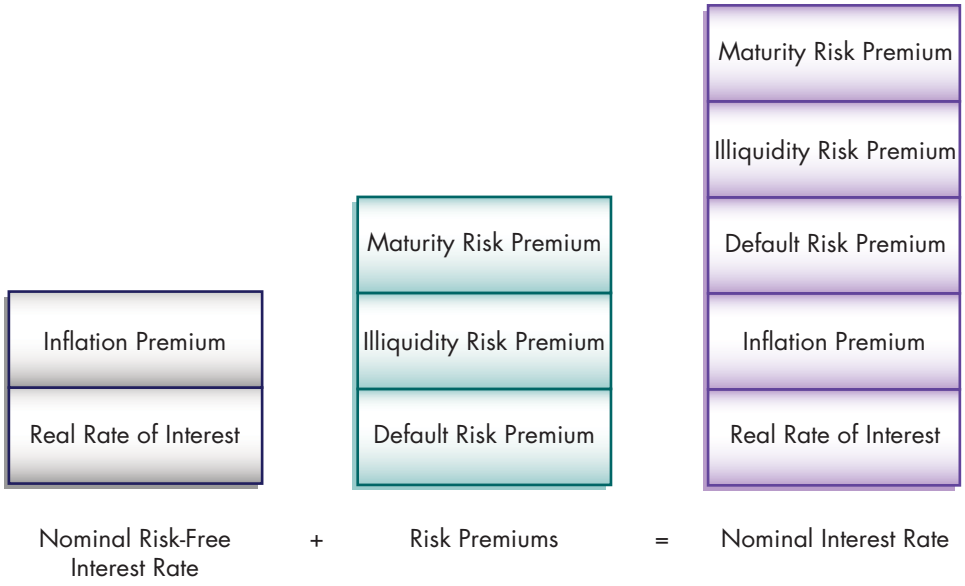

Figure 2-1 Components of the Nominal Interest Rate

The nominal interest rate is composed of the real interest rate plus a number of premiums. The nominal risk-free interest rate is the real rate plus an inflation premium. When risk premiums are added, the result is the total nominal interest rate.

Let's continue with the example on page 29, in which you lent a person $100. The total interest rate that you charged was 10 percent (the nominal interest rate). The portion of the total nominal rate that represents the return you demand for forgoing the opportunity to spend your money now is the real rate of interest. In our example, assume the real rate of interest is 2 percent.

Additions to the real rate of interest are called *premiums*. The major premiums are the inflation premium, the default risk premium, the liquidity risk premium, and the maturity risk premium.

The Inflation Premium Inflation erodes the purchasing power of money. If inflation is present, the dollars that lenders get when their loans are repaid may not buy as much as the dollars that they lent to start with. Therefore, lenders who anticipate inflation during the term of a loan will demand additional interest to compensate for it. This additional required interest is the **inflation premium.**

If, when you lent $100, you thought that the rate of inflation was going to be 4 percent a year during the life of the loan, you would add 4 percent to the 2 percent real rate of interest you charged for postponing your spending. The total interest rate charge—so far—would be 6 percent.

The Nominal Risk-Free Rate The interest rate that we have built so far, containing the real rate of interest and a premium to cover expected inflation, is often called the **nominal risk-free rate of interest**, as shown earlier in Figure 2-1. It is called this because it does not include any premiums for the uncertainties associated with borrowing or lending. The yield on short-term U.S. Treasury bills is often used as a proxy for the risk-free rate because the degree of uncertainty associated with these securities is very small.

Risk Premiums The remaining determinants of the nominal interest rate represent extra charges to compensate lenders for taking risk. Risks in lending come in a number of forms. The most common are default risk, illiquidity risk, and maturity risk.

The Default Risk Premium A *default* occurs when a borrower fails to pay the interest and principal on a loan on time. If a borrower has a questionable reputation or is having financial difficulties, the lender faces the risk that the borrower will default. The **default risk premium** is the extra compensation lenders demand for assuming the risk of default.

> In our $100 loan example, if you weren't completely sure that the person to whom you had lent $100 would pay it back, you would demand extra compensation—let's say, two percentage points—to compensate for that risk. The total interest rate demanded so far would be 2 percent real rate of interest + 4 percent inflation premium + 2 percent default risk premium = 8 percent.

The Illiquidity Risk Premium Sometimes lenders sell loans to others after making them. (This happens often in the mortgage business, in which investors trade mortgages among themselves.) Some loans are easily sold to other parties and others are not. Those that are easily sold are *liquid,* and those that aren't sold easily are considered *illiquid*. Illiquid loans have a higher interest rate to compensate the lender for the inconvenience of being stuck with the loan until it matures. The extra interest that lenders demand to compensate for the lack of liquidity is the illiquidity risk premium.

> You will probably not be able to sell your $100 loan to anyone else and will have to hold it until maturity. Therefore, you require another 1 percent to compensate for the lack of liquidity. The total interest rate demanded so far is 2 percent real rate of interest + 4 percent inflation premium + 2 percent default risk premium + 1 percent illiquidity risk premium = 9 percent.

The Maturity Risk Premium If interest rates rise, lenders may find themselves stuck with long-term loans paying the original rate prevailing at the time the loans were made, whereas other lenders are able to make new loans at higher rates. On the other hand, if interest rates go down, the same lenders will be pleased to find themselves receiving higher interest rates on their existing long-term loans than the rate at which other lenders must make new loans. Lenders respond to this risk that interest rates may change in the future in two ways:

- If lenders think interest rates might rise in the future, they may increase the rate they charge on their long-term loans now and decrease the rate they charge on their short-term loans now to encourage borrowers to borrow short term.
- Conversely, if lenders think interest rates might fall in the future, they may decrease the rate they charge on their long-term loans now and increase the rate they charge on their short-term loans now to encourage borrowers to borrow long term (locking in the current rate).

This up or down adjustment that lenders make to their current interest rates to compensate for the uncertainty about future changes in rates is called the **maturity risk premium**. The maturity risk premium can be either positive or negative.

Take Note

You can find the yield on U.S. Treasury bills very easily just by looking in *The Wall Street Journal* on page C-1. Yields on T-bills and a number of other securities are published there every business day. You can also find these yields at the Federal Reserve's website at *http://www.federalreserve.gov/releases/*. Click "Interest Rates" when you get there.

In our example, if you thought interest rates would probably rise before you were repaid the $100 you lent, you might demand an extra percentage point to compensate for the risk that you would be unable to take advantage of the new higher rates. The total rate demanded is now 10 percent (2 percent real rate of interest + 4 percent inflation premium + 2 percent default risk premium + 1 percent illiquidity risk premium + 1 percent maturity risk premium = 10 percent, the nominal interest rate).

The total of the real rate of interest, the inflation premium, and the risk premiums (the default, illiquidity, and maturity risk premiums) is the nominal interest rate, the compensation lenders demand from those who want to borrow money.

Next, we will consider the yield curve—a graph of a security's interest rates depending on the time to maturity.

The Yield Curve

A yield curve is a graphical depiction of interest rates for securities that differ only in the time remaining until their maturity. Yield curves are drawn by plotting the interest rates of one kind of security with various maturity dates. The curve depicts the interest rates of these securities at a given point in time.

Yield curves of U.S. Treasury securities are most common because with Treasury securities it is easiest to hold constant the factors other than maturity. All Treasury securities have essentially the same default risk (almost none) and about the same degree of liquidity (excellent). Any differences in interest rates observed in the yield curve, then, can be attributed to the maturity differences among the securities because other factors have essentially been held constant. Figure 2-2 shows a Treasury securities yield curve for April 13, 2006.

Making Use of the Yield Curve The shape of the yield curve gives borrowers and lenders useful information for financial decisions. Borrowers, for example, tend to look for the low point of the curve, which indicates the least expensive loan maturity. Lenders tend to look for the highest point on the curve, which indicates the most expensive loan maturity.

Finding the most advantageous maturity is not quite as simple as it sounds because it depends on more factors than cost. For instance, the least expensive maturity is not always the most advantageous for borrowers. If a firm borrows short term, for example, it may obtain the lowest interest rate, but the loan will mature in a short time and may have to be renewed at a higher rate if interest rates have risen in the interim. Borrowing for a longer term may cost a borrower more at the outset but less in the long run because the interest rate is locked in.

Lenders face the opposite situation. Granting long-term loans at relatively high interest rates may look attractive now; but if short-term rates rise, the lenders may miss profitable opportunities because their funds have already been invested. Both borrowers and lenders must balance their desire for return with their tolerance for risk.

To see a cool animated presentation of current and previous yield curves go to the website *http://www.smartmoney.com/onebond/indexcfm?story=yieldcurve* to see The Living Yield curve. There you will see how the yield curve changed when economic conditions changed.

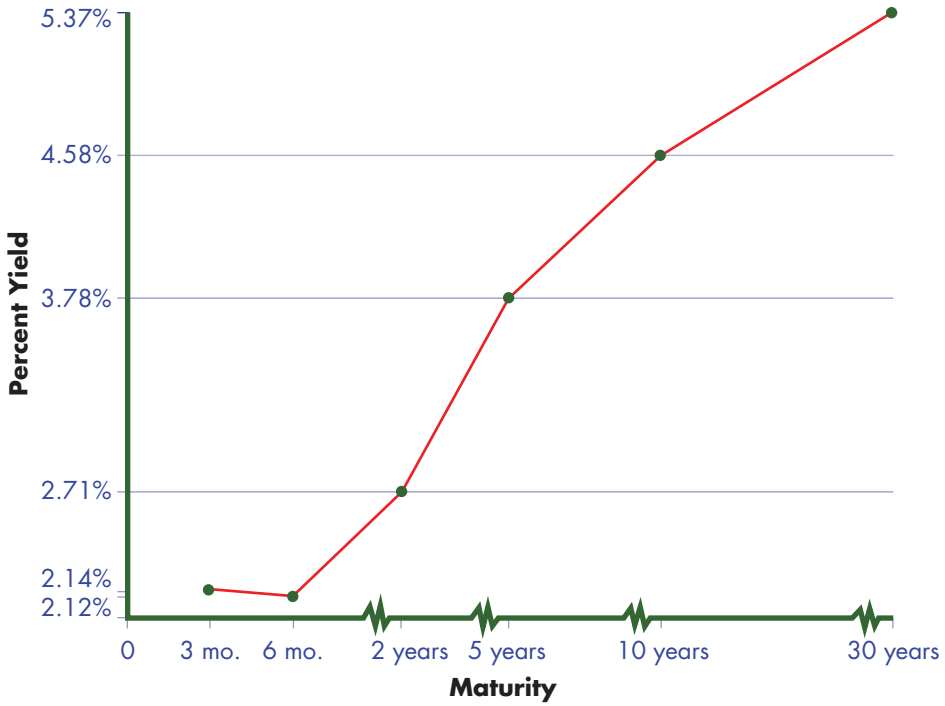

Figure 2-2
The Yield Curve as of April 13, 2006.

This yield curve shows interest rates on April 13, 2006 for U.S. Treasury securities having maturities from one to 30 years.

Data Source: Federal Reserve Statistical Release (*http://www.federalreserve.gov/releases/h15/Current/*) April 29, 2006.

What's Next

In this chapter we investigated financial markets, securities, and interest rates. In the next chapter, we will look at another part of the financial environment, financial institutions.

Summary

1. Describe how the U.S. financial system works.

The financial system is made up of surplus economic units, entities and individuals that have excess funds, and deficit economic units, entities and individuals that need to acquire additional funds. The financial system provides the network that brings these two groups together so that funds flow from the surplus economic units to the deficit economic units.

2. Define *financial securities*.

Securities are documents that represent a person's right to receive funds in the future. Firms issue securities in exchange for funds they need now, and investors trade securities among themselves.

3. Explain the function of financial intermediaries.

Financial intermediaries act to put those in need of funds in contact with those who have funds available. Investment banking firms help businesses acquire funds from the public by issuing securities in the financial marketplace. Brokers help members of the public trade securities with each other. Dealers buy and sell securities themselves.

4. Identify the different financial markets.

Financial markets are forums in the financial system that allow surplus economic units to transact with deficit economic units and for portfolio adjustments to be made. Securities change hands in financial markets. The financial markets include the primary market, in which new securities are issued for the first time; the secondary market, in which previously issued securities are traded among investors; the money market, in which securities with maturities of less than one year are traded; and the capital market, in which securities with maturities longer than one year are traded. Some securities are traded on organized exchanges, such as the New York Stock Exchange, and others are traded over the counter (OTC) in a network of securities dealers.

5. List and define the securities traded in the money and capital markets.

Securities traded in the money market include:

- Treasury bills: short-term debt instruments issued by the U.S. Treasury that are sold at a discount and pay face value at maturity.
- Negotiable certificates of deposit (CDs): certificates that can be traded in financial markets and represent amounts deposited at banks that will be repaid at maturity with a specified rate of interest.
- Commercial paper: unsecured short-term promissory notes issued by large corporations with strong credit ratings.
- Banker's acceptances: documents that signify that a bank has guaranteed payment of a certain amount at a future date if the original promisor doesn't pay.

The two major securities traded in the capital market include:

- Bonds: long-term securities that represent a promise to pay a fixed amount at a future date, usually with interest payments made at regular intervals. Treasury bonds are issued by the U.S. government, corporate bonds are issued by firms, and municipal bonds are issued by state and local governments.
- Stocks: shares of ownership interest in corporations. Preferred stock comes with promised dividends but usually no voting rights. Common stock may come with dividends, paid at the discretion of the board, but does have voting rights. Common stockholders share in the residual profits of the firm.

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6. Identify the determinants of the nominal interest rate.

The nominal interest rate has three main determinants:

- The real rate of interest: the basic rate lenders require to compensate for forgoing the opportunity to spend money during the term of the loan.
- An inflation premium: a premium that compensates for the expected erosion of purchasing power due to inflation over the life of the loan.
- Risk premiums: premiums that compensate for the risks of default (the risk that the lender won't be paid back), illiquidity (the risk that the lender won't be able to sell the security in a reasonable time at a fair price), and maturity (the risk that interest rates may change adversely during the life of the security).

7. Construct and analyze a yield curve.

A yield curve is a graphical depiction of interest rates on securities that differ only in the time remaining until their maturity. Lenders and borrowers may use a yield curve to determine the most advantageous loan maturity.

Self-Test

ST-1. To minimize risk, why don't most firms simply finance their growth from the profits they earn?

ST-2. What market would a firm most probably go to if it needed cash for 90 days? If it needed cash for 10 years?

ST-3. If your company's stock were not listed on the New York Stock Exchange, how could investors purchase the shares?

ST-4. What alternatives does Microsoft, a very large and secure firm, have for obtaining $3 million for 60 days?

ST-5. Assume Treasury security yields for today are as follows:

- One-year T-notes, 5.75%
- Two-year T-notes, 5.5%
- Three-year T-notes, 5.25%
- Five-year T-notes, 5.0%
- Ten-year T-notes, 4.75%
- Twenty-year, T-bonds 4%
- Thirty-year, T-bonds 3.25%

Draw a yield curve based on these data.

Review Questions

1. What are financial markets? Why do they exist?

2. What is a security?

3. What are the characteristics of an efficient market?

4. How are financial trades made on an organized exchange?

5. How are financial trades made in an over-the-counter market? Discuss the role of a dealer in the OTC market.

6. What is the role of a broker in security transactions? How are brokers compensated?

7. What is a Treasury bill? How risky is it?

8. Would there be positive interest rates on bonds in a world with absolutely no risk (no default risk, maturity risk, and so on)? Why would a lender demand, and a borrower be willing to pay, a positive interest rate in such a no-risk world?

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Build Your Communication Skills

CS-1. Imagine the following scenario:

Your firm has decided to build a new plant in South America this year. The plant will cost $10 million and all the money must be paid up front. Your boss has asked you to brief the board of directors on the options the firm has for raising the $10 million.

Prepare a memo for the board members outlining the pros and cons of the various financing options open to the firm. Divide into small groups. Each group member should spend five minutes presenting his or her financing option suggestions to the rest of the group members, who should act as the board members.

CS-2. Prepare an IOU, or "note," that promises to pay $100 one year from today to the holder of the note.

a. Auction this note off to someone else in the class, having the buyer pay for it with a piece of scratch-paper play money.

b. Compute the note buyer's percent rate of return if he or she holds the note for a year and cashes it in.

c. Ask the new owner of the note to auction it off to someone else. Note the new buyer's rate of return based on his or her purchase price.

d. Discuss the operation of the market the class has created. Note the similarities between it and the bond market in the real world.

Problems

The Financial System

2-1. a. What are "surplus economic units"? Give two examples of entities in the financial system that typically would be classified as surplus economic units.

b. What are "deficit economic units"? Give two examples of entities in the financial system that typically would be classified as deficit economic units.

Financial Markets

2-2. Answer the following, true or false:

a. Trades among investors at the New York Stock Exchange are primary market transactions.

b. The money market is where firms go to obtain funding for long-term projects.

c. Your firm has $2,000,000 of excess funds that will not be needed for one month. You would most likely go to the capital market to invest the money until needed.

d. Gold and international currencies are traded in the money market.

Financial Markets

2-3. a. Arrange the following markets in order from most efficient to least efficient.

1. The real estate market

2. The money market

3. The secondary market (New York Stock Exchange)

4. The over-the-counter market

b. Explain the rationale you used to order the markets the way you did in part a.

2-4. **a.** What characteristics must a security have to be traded in the money market?

b. Give two examples of securities that are traded in the money market.

Securities in the Financial Market

2-5. Public Service Company of North Carolina issued $150 million worth of bonds this year. The bonds had a face value of $1,000 each, and each came with a promise to pay the bearer $66.25 a year in interest during the life of the bond. What is the coupon interest rate of these bonds?

Securities in the Financial Market

2-6. If the real rate of interest is 2 percent, inflation is expected to be 3 percent during the coming year, and the default risk premium, illiquidity risk premium, and maturity risk premium for the Bonds-R-Us corporation are all 1 percent each, what would be the yield on a Bonds-R-Us bond?

Nominal Interest Rate

2-7. Assume Treasury security yields for today are as follows:

Yield Curve

- Three-month T-bills, 4.50%
- Six-month T-bills, 4.75%
- One-year T-notes, 5.00%
- Two-year T-notes, 5.25%
- Three-year T-bonds, 5.50%
- Five-year T-bonds, 5.75%
- Ten-year T-bonds, 6.00%
- Thirty-year T-bonds, 6.50%

Draw a yield curve based on these data. Discuss the implications if you are:

a. a borrower

b. a lender

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Answers to Self-Test

ST-1. In most cases, profits are insufficient to provide the funds needed, especially with large projects. Financial markets provide access to external sources of funds.

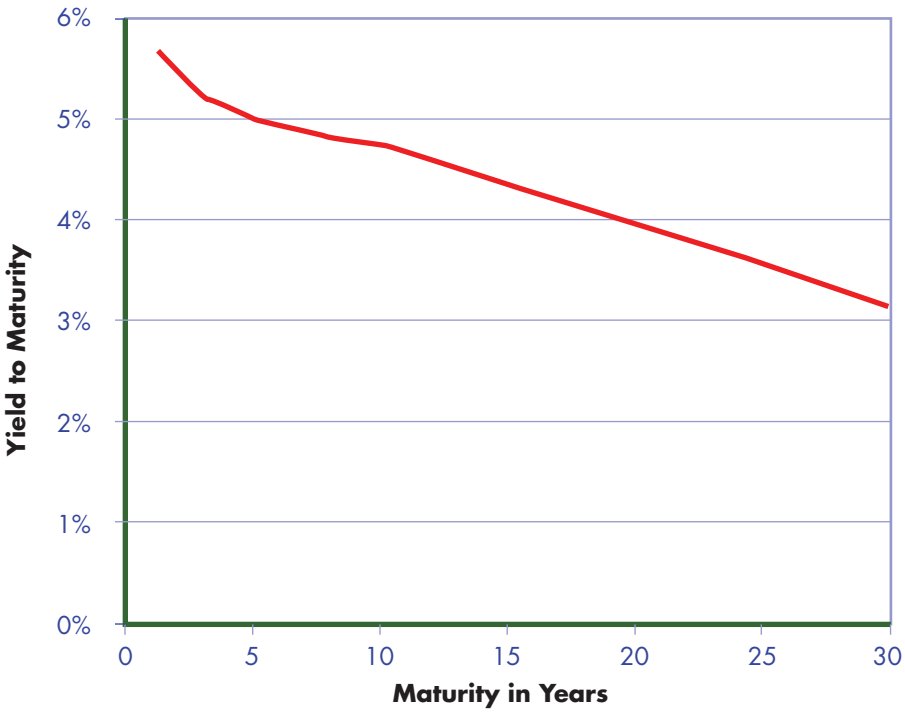
ST-2. To obtain cash for 90 days, a business firm would most probably go to the money market, in which it would sell a 90-day security. To obtain cash for 10 years, a firm would sell a security in the capital market.

ST-3. Investors would simply purchase the shares on another exchange, or over the counter from a dealer. (Investors simply call their brokers to purchase stock. Brokers decide where to get it.)

ST-4. Microsoft could

- obtain a 60-day loan from a financial institution
- delay payments to its suppliers
- sell commercial paper notes in the money market

ST-5. The yield curve follows:



Take Note
Notice that this yield curve is downward sloping, which indicates that lenders expect interest rates to fall in the future. (See the discussion about the maturity risk premium on pages 31–32.) A downward sloping curve such as this one is called an inverted yield curve.

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