CHAPTER 20

Long-Term Debt

Executive Summary

The previous chapter introduced the mechanics of new long-term financing, with an emphasis on equity. This chapter takes a closer look at long-term debt instruments.

The chapter begins with a review of the basic features of long-term debt, and a description of some important aspects of publicly issued long-term bonds. We also discuss forms of long-term financing that are not publicly issued: term loans and private-placement bonds. These are directly placed with lending institutions, such as a commercial bank or a life insurance company.

All bond agreements have protective covenants. These are restrictions on the firm that protect the bondholder. We present several types of protective covenants in this chapter.

A large number of publicly issued industrial bonds have call provisions, which enable a company to buy back its bonds at a predetermined call price. This chapter attempts to answer two questions about call provisions.

1. Should firms issue callable bonds?
2. When should such bonds be called?

There are many different kinds of long-term bonds. We discuss three—floating-rate bonds, income bonds, and deep-discount bonds—and analyze what types of bonds are best in different circumstances.

20.1 Long-Term Debt: A Review

Long-term debt securities are promises by the issuing firm to pay interest and principal on the unpaid balance. The *maturity* of a long-term debt instrument refers to the length of time the debt remains outstanding with some unpaid balance. Debt securities can be *short-term* (maturities of one year or less) or *long-term* (maturities of more than one year).[1] Short-term debt is sometimes referred to as *unfunded debt* and long-term debt as *funded debt.*[2]

The two major forms of long-term debt are public issue and privately placed debt. We discuss public-issue bonds first, and most of what we say about them holds true for privately placed long-term debt as well. The main difference between publicly issued and privately placed debt is that private debt is directly placed with a lending institution.

There are many other attributes to long-term debt, including security, call features, sinking funds, ratings, and protective covenants. The boxed material illustrates these attributes.

[1]In addition, people often refer to intermediate-term debt, which has a maturity of more than one year and less than three to five years.

[2]The word *funding* generally implies long-term. Thus, a firm planning to *fund* its debt requirements may be replacing short-term debt with long-term debt.

Features of a Hypothetical Bond

	Terms	Explanations
Amount of issue	$100 million	The company issued $100 million of bonds.
Date of issue	10/21/95	The bonds were sold on 10/21/95.
Maturity	12/31/24	The principal will be paid in 30 years.
Denomination	$1,000	Each individual bond will pay $1,000 at maturity.
Annual coupon	10.50	Because the denomination of each bond is $1,000, each bondholder will receive $105 per bond per year.
Offer price	100	The offer price was 100 percent of the denomination, or $1,000 per bond.
Yield to maturity	10.50%	If the bond is held to maturity, bondholders will receive a stated annual rate of return equal to 10.5 percent.
Dates of coupon payments	12/31, 6/30	Coupons of $52.50 will be paid on these dates.
Security	None	The bonds are debentures.
Sinking funds	Annual; begins in 2005	The sinking funds will be sufficient to pay 80 percent of principal, the balance to be paid at maturity.
Call provision	Not callable before 12/31/05 Call price: $1,100	The bonds have a deferred call feature. After 12/31/05 the company can buy back the bonds for $1,100 per bond.
Rating	Moody's Aaa	This is Moody's highest rating. The bonds have the lowest probability of default.

20.2 The Public Issue of Bonds

The general procedures followed for a **public issue** of bonds are the same as those for stocks, as described in the previous chapter. First, the offering must be approved by the board of directors. Sometimes a vote of stockholders is also required. Second, a registration statement is prepared for review by the Securities and Exchange Commission. Third, if accepted, the registration statement becomes *effective* 20 days later, and the securities are sold.

However, the registration statement for a public issue of bonds must include an indenture, a document not relevant for the issue of common stock. An **indenture** is a written agreement between the corporation (the borrower) and a trust company. It is sometimes referred to as the *deed of trust.*[3] The trust company is appointed by the corporation to represent the bondholders. The trust company must (1) be sure the terms of the indenture are obeyed, (2) manage the sinking fund, and (3) represent bondholders if the company defaults on its payments.

The typical bond indenture can be a document of several hundred pages, and it generally includes the following provisions:

1. The basic terms of the bonds.
2. A description of property used as security.

[3]The terms *loan agreement* or *loan contract* are usually used for privately placed debt and term loans.

3. Details of the protective covenants.
4. The sinking-fund arrangements.
5. The call provision.

Each of these is discussed next.

The Basic Terms

Bonds usually have a *face value* of $1,000. This is also called the *principal value* or the *denomination* and it is stated on the bond certificate. In addition, the *par value* (i.e., initial accounting value) of a bond is almost always the same as the face value.

Transactions between bond buyers and bond sellers determine the market value of the bond. Actual bond-market values depend on the general level of interest rates, among other factors, and need not equal the face value. The bond price is quoted as a percentage of the denomination. Though interest is paid only twice a year, interest *accrues* continually over the year, and the quoted prices of a bond usually include accrued interest. This is illustrated in the example below.

EXAMPLE

Suppose the Black Corporation has issued 100 bonds. The amount stated on each bond certificate is $1,000. The total face value or principal value of the bonds is $100,000. Further suppose the bonds are currently *priced* at 100, which means 100 percent of $1,000. This means that buyers and sellers are holding bonds at a price per bond of $1,000. If interest rates rise, the price of the bond might fall to, say, 97, which means 97 percent of $1,000, or $970.

Suppose the bonds have a stated interest rate of 12 percent due on January 1, 2050. The bond indenture might read as follows:

> The bond will mature on January 1, 2050, and will be limited in aggregate principal amount to $100,000. Each bond will bear interest at the rate of 12.0% per annum from January 1, 1990, or from the most recent Interest Payment Date to which interest has been paid or provided for. Interest is payable semiannually on July 1 and January 1 of each year.

Suppose an investor buys the bonds on April 1. Since the last interest payment, on January 1, three months of interest at 12 percent per year would have accrued. Because interest of 12 percent a year works out to 1 percent per month, interest over the three months is 3 percent. Therefore, the buyer of the bond must pay a price of 100 percent plus the 3 percent of accrued interest ($30). On July 1 the buyer will receive an interest payment of $60. This can be viewed as the sum of the $30 he or she paid the seller plus the three months of interest, $30, for holding the bond from April 1 to July 1.

As is typical of industrial bonds, the Black bonds are registered. The indenture might read as follows:

> Interest is payable semiannually on July 1 and January 1 of each year to the person in whose name the bond is registered at the close of business on June 15 or December 15, respectively.

This means that the company has a registrar who will record the ownership of each bond. The company will pay the interest and principal by check mailed directly to the address of the owner of record.

When a bond is registered with attached coupons, the bondholder must separate a coupon from the bond certificate and send it to the company registrar (paying agent). Some bonds are in **bearer** form. This means that ownership is not recorded in the company books. As with a registered bond with attached coupons, the holder of the bond certificate separates the coupon and sends it in to the company to receive payment.

There are two drawbacks to bearer bonds. First, they can be easily lost or stolen. Second, because the company does not know who owns its bonds, it cannot notify bondholders of important events. Consider, for example, Mr. and Mrs. Smith, who go to their safe-deposit box and clip the coupon on their 12-percent, $1,000 bond issued by the Black Corporation. They send the coupon to the paying agent and feel richer. A few days later, a notice comes from the paying agent that the bond was retired and its principal paid off one year earlier. In other words, the bond no longer exists. Mr. and Mrs. Smith must forfeit one year of interest. (Of course, they can turn their bond in for $1,000.)

However, bearer bonds have the advantage of secrecy because even the issuing company does not know who the bond's owners are. This secrecy is particularly vexing to taxing authorities because tax collection on interest is difficult if the holder is unknown.

Security

Debt securities are also classified according to the *collateral* protecting the bondholder. Collateral is a general term for the assets that are pledged as a security for payment of debt. For example, *collateral trust bonds* involve a pledge of common stock held by the corporation.

Example

Suppose Railroad Holding Company owns all of the common stock of Track, Inc.; that is, Track, Inc., is a wholly owned subsidiary of the Railroad Holding Company. Railroad issues debt securities that pledge the common stock of Track, Inc., as collateral. The debts are collateral trust bonds; U.S. Sur Bank will hold them. If Railroad Holding Company defaults on the debt, U.S. Sur Bank will be able to sell the stock of Track, Inc., to satisfy Railroad's obligation.

Mortgage securities are secured by a mortgage on real estate or other long-term assets of the borrower.[4] The legal document that describes that mortgage is called a *mortgage-trust indenture* or *trust deed.* The mortgage can be *closed-end,* so that there is a limit as to the amount of bonds that can be issued. More frequently it is *open-end,* without limit to the amount of bonds that may be issued.

Example

Suppose the Miami Bond Company has buildings and land worth $10 million and a $4 million mortgage on these properties. If the mortgage is closed-end, the Miami Bond Company cannot issue more bonds on this property.

If the bond indenture contains no clause limiting the amount of additional bonds that can be issued, it is an open-end mortgage. In this case the Miami Bond Company can issue additional bonds on its property, making the existing bonds riskier. For example, if additional mortgage bonds of $2 million are issued, the

[4] A set of railroad cars is an example of "other long-term assets" used as security.

property has been pledged for a total of $6 million of bonds. If Miami Bond Company must liquidate its property for $4 million, the original bondholders will receive ⅔, or 67 percent, of their investment. If the mortgage had been closed-end, they would have received 100 percent of the stated value.

The value of a mortgage depends on the market value of the underlying property. Because of this, mortgage bonds sometimes require that the property be properly maintained and insured. Of course, a building and equipment bought in 1914 for manufacturing slide rules might not have much value no matter how well the company maintains it. The value of any property ultimately depends on its next best economic use. Bond indentures cannot easily insure against losses in economic value.

Sometimes mortgages are on specific property, for example, a single building. More often, blanket mortgages are used. A blanket mortgage pledges many assets owned by the company.

Some bonds represent unsecured obligations of the company. A **debenture** is an unsecured bond, where no specific pledge of property is made. Debenture holders have a claim on property not otherwise pledged: the property that remains after mortgages and collateral trusts are taken into account. At the current time, almost all public bonds issued by industrial and finance companies are debentures. However, most utility and railroad bonds are secured by a pledge of assets.

Protective Covenants

A **protective covenant** is that part of the indenture or loan agreement that limits certain actions of the borrowing company. Protective covenants can be classified into two types: negative covenants and positive covenants. A **negative covenant** limits or prohibits actions that the company may take. Here are some typical examples:

1. Limitations are placed on the amount of dividends a company may pay.
2. The firm cannot pledge any of its assets to other lenders.
3. The firm cannot merge with another firm.
4. The firm may not sell or lease its major assets without approval by the lender.
5. The firm cannot issue additional long-term debt.

A **positive covenant** specifies an action that the company agrees to take or a condition the company must abide by. Here are some examples:

1. The company agrees to maintain its working capital at a minimum level.
2. The company must furnish periodic financial statements to the lender.

The financial implications of protective covenants were treated in detail in the chapters on capital structure. In that discussion, we argued that protective covenants can benefit stockholders because, if bondholders are assured that they will be protected in times of financial stress, they will accept a lower interest rate.

The Sinking Fund

Bonds can be entirely repaid at maturity, at which time the bondholder will receive the stated value of the bond, or they can be repaid before maturity. Early repayment is more typical.

In a direct placement of debt the repayment schedule is specified in the loan contract. For public issues, the repayment takes place through the use of a sinking fund and a call provision.

A *sinking fund* is an account managed by the bond trustee for the purpose of repaying the bonds. Typically, the company makes yearly payments to the trustee. The trustee can purchase bonds in the market or can select bonds randomly using a lottery and purchase them, generally at face value. There are many different kinds of sinking-fund arrangements:

- Most sinking funds start between 5 and 10 years after the initial issuance.
- Some sinking funds establish equal payments over the life of the bond.
- Most high-quality bond issues establish payments to the sinking fund that are not sufficient to redeem the entire issue. As a consequence, there is the possibility of a large *balloon* payment at maturity.

Sinking funds have two opposing effects on bondholders:

1. *Sinking Funds Provide Extra Protection to Bondholders.* A firm experiencing financial difficulties would have trouble making sinking-fund payments. Thus, sinking-fund payments provide an early warning system to bondholders.
2. *Sinking Funds Give the Firm an Attractive Option.* If bond prices fall below the face value, the firm will satisfy the sinking fund by buying bonds at the lower market prices. If bond prices rise above the face value, the firm will buy the bonds back at the lower face value.

The Call Provision

A *call provision* lets the company repurchase or *call* the entire bond issue at a predetermined price over a specified period.

Generally, the call price is above the bond's face value of $1,000. The difference between the call price and the face value is the **call premium.** For example, if the call price is 105, that is, 105 percent of $1,000, the call premium is 50. The amount of the call premium usually becomes smaller over time. One typical arrangement is to set the call premium initially equal to the annual coupon payment and then make it decline to zero over the life of the bond.

Call provisions are not usually operative during the first few years of a bond's life. For example, a company may be prohibited from calling its bonds for the first 10 years. This is referred to as a **deferred call.** During this period the bond is said to be **call-protected.**

CONCEPT QUESTIONS ?

- Do bearer bonds have any advantage? Why might Mr. "I Like to Keep My Affairs Private" prefer to hold bearer bonds?
- What advantages and what disadvantages do bondholders derive from provisions of sinking funds?
- What is a call provision? What is the difference between the call price and the stated price?

20.3 Bond Refunding

Replacing all or part of an issue of outstanding bonds is called bond **refunding.** Usually, the first step in a typical bond refunding is to call the entire issue of bonds at the call price. Bond refunding raises two questions:

1. Should firms issue callable bonds?
2. Given that callable bonds have been issued, when should the bonds be called?

We attempt to answer these questions in this section.

Should Firms Issue Callable Bonds?

Common sense tells us that call provisions have value. First, many publicly issued bonds have call provisions. Second, it is obvious that a call works to the advantage of the issuer. If interest rates fall and bond prices go up, the option to buy back the bonds at the call price is valuable. In bond refunding, firms will typically replace the called bonds with a new bond issue. The new bonds will have a lower coupon rate than the called bonds.

However, bondholders will take the call provision into account when they buy the bond. For this reason, we can expect that bondholders will demand higher interest rates on callable bonds than on noncallable bonds. In fact, financial economists view call provisions as being zero-sum in efficient capital markets.[5] Any expected gains to the issuer from being allowed to refund the bond at lower rates will be offset by higher initial interest rates. We illustrate the zero-sum aspect to callable bonds in the following example.

Example

Suppose Kraus Intercable Company intends to issue perpetual bonds of $1,000 face value at a 10-percent interest rate.[6] Annual coupons have been set at $100. There is an equal chance that by the end of the year interest rates will do one of the following:

1. Fall to 6 2/3 percent. If so, the bond price will increase to $1,500.
2. Increase to 20 percent. If so, the bond price will fall to $500.

Noncallable Bond Suppose the market price of the noncallable bond is the expected price it will have next year plus the coupon, all discounted at the current 10-percent interest rate.[7] The value of the noncallable bond is

Value of Noncallable Bond:

$$\frac{\text{First-year coupon} + \text{Expected price at end of year}}{1 + r}$$
$$= \frac{\$100 + (0.5 \times \$1{,}500) + (0.5 \times \$500)}{1.10}$$
$$= \$1{,}000$$

Callable Bond Now suppose the Kraus Intercable Company decides to issue callable bonds. The call premium is set at $100 over par value and the bonds can be called *only* at the end of the first year.[8] In this case, the call provision will allow the company to buy back its bonds at $1,100 ($1,000 par value plus the $100 call premium). Should interest rates fall, the company will buy a bond for $1,100 that would be worth $1,500 in the absence of a call provision. Of course, if interest rates rise, Kraus would not want to call the bonds for $1,100 because they are worth only $500 on the market.

[5]See A. Kraus, "An Analysis of Call Provisions and the Corporate Refunding Decision," *Midland Corporate Finance Journal* 1 (Spring 1983), p. 1.

[6]Recall that perpetual bonds have no maturity date.

[7]We are assuming that the current price of the noncallable bonds is the expected value discounted at the risk-free rate of 10 percent. This is equivalent to assuming that the risk is unsystematic and carries no risk premium.

[8]Normally, bonds can be called over a period of many years. Our assumption that the bond can only be called at the end of the first year was introduced for simplicity.

Suppose rates fall and Kraus calls the bonds by paying $1,100. If the firm simultaneously issues new bonds with a coupon of $100, it will bring in $1,500 ($100/0.0667) at the 6 2/3-percent interest rate. This will allow Kraus to pay an extra dividend to shareholders of $400 ($1,500 − $1,100). In other words, if rates fall from 10 percent to 6 2/3 percent, exercise of the call will transfer $400 of potential bondholder gains to the shareholders.

When investors purchase callable bonds, they realize that they will forfeit their anticipated gains to shareholders if the bonds are called. As a consequence, they will not pay $1,000 for a callable bond with a coupon of $100.

How high must the coupon on the callable bond be so that it can be issued at the par value of $1,000? We can answer this in three steps.

Step 1: Determining End-of-Year Value if Interest Rates Drop If the interest rate drops to 6 2/3 percent by the end of the year, the bond will be called for $1,100. The bondholder will receive both this and the annual coupon payment. If we let C represent the coupon on the callable bond, the bondholder gets the following at the end of the year:

$$\$1{,}100 + C$$

Step 2: Determining End-of-Year Value if Interest Rates Rise If interest rates rise to 20 percent, the value of the bondholder's position at the end of the year is:

$$\frac{C}{0.20} + C$$

That is, the perpetuity formula tells us that the bond will sell at $C/0.20$. In addition, the bondholder receives the coupon payment at the end of the year.

Step 3: Solving for C Because interest rates are equally likely to rise or to fall, the expected value of the bondholder's end-of-year position is

$$(\$1{,}100 + C) \times 0.5 + \left(\frac{C}{0.20} + C\right) \times 0.5$$

Using the current interest rate of 10 percent, we set the present value of these payments equal to par:

$$\$1{,}000 = \frac{(\$1{,}100 + C) \times 0.5 + \left(\frac{C}{0.20} + C\right) \times 0.5}{1.10}$$

C is the unknown in the equation. The equation holds if $C = \$157.14$. In other words, callable bonds can sell at par only if their coupon rate is 15.714 percent.

The Paradox Restated If Kraus issues a noncallable bond, it will only need to pay a 10-percent interest rate. By contrast, Kraus must pay an interest rate of 15.7 percent on a callable bond. The interest-rate differential makes an investor indifferent whether she buys one of the two bonds in our example or the other. Because the return to the investor is the same with either bond, the cost of debt capital is the same to Kraus with either bond. Thus, our example suggests that there is neither an advantage nor a disadvantage from issuing callable bonds.

Why, therefore, are callable bonds issued in the real world? This question has vexed financial economists for a long time. We now consider four specific reasons why a company might use a call provision:

1. Superior interest-rate predictions.
2. Taxes.

3. Financial flexibility for future investment opportunities.
4. Less interest-rate risk.

Superior Interest-Rate Forecasting Company insiders may know more about interest-rate changes on its bonds than does the investing public. For example, managers may be better informed about potential changes in the firm's credit rating. Thus, a company may prefer the call provision at a particular time because it believes that the expected fall in interest rates (the probability of a fall multiplied by the amount of the fall) is greater than the bondholders believe.

Although this is possible, there is reason to doubt that inside information is the rationale for call provisions. Suppose firms really had superior ability to predict changes that would affect them. Bondholders would infer that a company expected an improvement in its credit rating whenever it issued callable bonds. Bondholders would require an increase in the coupon rate to protect them against a call if this occurred. As a result, we would expect that there would be no financial advantage to the firm from callable bonds over noncallable bonds.

Of course, there are many non–company-specific reasons why interest rates can fall. For example, the interest-rate level is connected to the anticipated inflation rate. But it is difficult to see how companies could have more information about the general level of interest rates than other participants in the bond markets.

Taxes Call provisions may have tax advantages if the bondholder is taxed at a lower rate than the company. We have seen that callable bonds have higher coupon rates than noncallable bonds. Because the coupons provide a deductible interest expense to the corporation and are taxable income to the bondholder, the corporation will gain more than a bondholder in a low tax bracket will lose. Presumably, some of the tax saving can be passed on to the bondholders in the form of a high coupon.

Future Investment Opportunities As we have explained, bond indentures contain protective covenants that restrict a company's investment opportunities. For example, protective covenants may limit the company's ability to acquire another firm or to sell certain assets (for example, a division of the company). If the covenants are sufficiently restrictive, the cost to the shareholders in lost net present value can be large. However, if bonds are callable, the company can buy back the bonds at the call price and take advantage of a superior investment opportunity.[9]

Less Interest-Rate Risk The call provision will reduce the sensitivity of a bond's value to changes in the level of interest rates. As interest rates increase, the value of a noncallable bond will fall. Because the callable bond has a higher coupon rate, the value of a callable bond will fall less than the value of a noncallable bond. Kraus has argued that, by reducing the sensitivity of a bond's value to changes in interest rates, the call provision may reduce the risk of shareholders as well as bondholders.[10] He argues that, because the bond is a liability of the corporation, the equityholders bear risk as the bond changes value over time. Thus, it can be shown that, under certain conditions, reducing the risk of bonds through a call provision will also reduce the risk of equity.

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[9]This argument is from Z. Bodie and R. A. Taggart, "Future Investment Opportunities and the Value of the Call Provision on a Bond," *Journal of Finance* 33 (1978), p. 4.

[10]A. Kraus, "An Analysis of Call Provisions and the Corporate Refunding Decision," *Midland Corporate Finance Journal* 1 (Spring 1983). Kraus points out that the call provision will not always reduce the equity's interest-rate risk. If the firm as a whole bears interest-rate risk, more of this risk may be shifted from equityholders to bondholders with noncallable debt. In this case, equityholders may actually bear more risk with callable debt.

Calling Bonds: When Does It Make Sense?

The value of the company is the value of the stock plus the value of the bonds. From the Modigliani-Miller theory and the pie model in earlier chapters, we know that firm value is unchanged by how it is divided between these two instruments. Therefore, maximizing shareholder wealth means minimizing the value of the callable bond. In a world with no transaction costs, it can be shown that the company should call its bonds whenever the callable-bond value exceeds the call price. This policy minimizes the value of the callable bonds.

The preceding analysis is modified slightly by including the costs from issuing new bonds. These extra costs change the refunding rule to allow bonds to trade at prices above the call price. The objective of the company is to minimize the sum of the value of the callable bonds plus new issue costs. It has been observed that many real-world firms do not call their bonds when the market value of the bonds reaches the call price. Instead, they wait until the market value of the bonds exceeds the call price. Perhaps these issue costs are an explanation. Also, when a bond is called, the holder has about 30 days to surrender the bond and receive the call price in cash. In 30 days the market value of the bonds could fall below the call price. If so, the firm is giving away money. To forestall this possibility, it can be argued that firms should wait until the market value of the bond exceeds the call price before calling bonds.

CONCEPT QUESTIONS ?

- What are the advantages to a firm of having a call provision?
- What are the disadvantages to bondholders of having a call provision?

20.4 BOND RATINGS

Firms frequently pay to have their debt rated. The two leading bond-rating firms are Moody's Investors Service and Standard & Poor's. The debt ratings depend upon (1) the likelihood that the firm will default and (2) the protection afforded by the loan contract in the event of default. The ratings are constructed from information supplied by the corporation, primarily the financial statements of the firm. The rating classes are shown in the accompanying box.

The highest rating debt can have is AAA or Aaa. Debt rated AAA or Aaa is judged to be the best quality and to have the lowest degree of risk. The lowest rating is D, which indicates that the firm is in default. Since the 1980s, a growing part of corporate borrowing has taken the form of *low-grade bonds.* These bonds are also known as either *high-yield bonds* or *junk bonds.* Low-grade bonds are corporate bonds that are rated below *investment grade* by the major rating agencies (that is, below BBB for Standard & Poor's or Baa for Moody's).

Bond ratings are important, because bonds with lower ratings tend to have higher interest costs. However, the most recent evidence is that bond ratings merely reflect bond risk. There is no conclusive evidence that bond ratings affect risk.[11] It is not surprising that the stock prices and bond prices of firms do not show any unusual behavior on the days around a rating change. Because the ratings are based on publicly available information, they probably do not, in themselves, supply new information to the market.[12]

[11] M. Weinstein, "The Systematic Risk of Corporate Bonds," *Journal of Financial and Quantitative Analysis* (September 1981); J. P. Ogden, "Determinants of Relative Interest Rate Sensitivity of Corporate Bonds," *Financial Management* (Spring 1987); and F. Reilly and M. Joehnk, "The Association between Market-Based Risk Measures for Bonds and Bond Ratings," *Journal of Finance* (December 1976).

[12] M. Weinstein, "The Effect of a Ratings Change Announcement on Bond Price," *Journal of Financial Economics* 5 (1977). However, Robert W. Holthausen and Richard W. Leftwich, "The Effect of Bond Rating Changes on Common Stock Prices," *Journal of Financial Economics* 17 (September 1986), find that bond rating downgrades are associated with abnormal negative returns of the stock of the issuing firm.

Bond Ratings

	Very High Quality	High Quality	Specu-lative	Very Poor
Standard & Poor's	AAA AA	A BBB	BB B	CCC CC C D
Moody's	Aaa Aa	A Baa	Ba B	Caa Ca C D

At times both Moody's and Standard & Poor's adjust these ratings. S&P uses plus and minus signs: A+ is the strongest A rating and A− the weakest. Moody's uses a 1, 2, or 3 designation, with 1 indicating the strongest.

Moody's	S&P	
Aaa	AAA	Debt rated Aaa and AAA has the highest rating. Capacity to pay interest and principal is extremely strong.
Aa	AA	Debt rated Aa and AA has a very strong capacity to pay interest and repay principal. Together with the highest rating, this group comprises the high-grade bond class.
A	A	Debt rated A has a strong capacity to pay interest and repay principal. However, it is somewhat more susceptible to adverse changes in circumstances and economic conditions.
Baa	BBB	Debt rated Baa and BBB is regarded as having an adequate capacity to pay interest and repay principal. Whereas it normally exhibits adequate protection parameters, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity to pay interest and repay principal for debt in this category than in higher-rated categories. These bonds are medium grade obligations.
Ba B Caa Ca	BB B CCC CC	Debt rated in these categories is regarded, on balance, as predominantly speculative. Ba and BB indicate the lowest degree of speculation, and Ca and CC the highest. Although such debt is likely to have some quality and protective characteristics, these are outweighed by large uncertainties or major risk exposure to adverse conditions.
C	C	This rating is reserved for income bonds on which no interest is being paid.
D	D	Debt rated D is in default, and payment of interest and/or repayment of principal is in arrears.

Data from various editions of *Standard & Poor's Bond Guide* and *Moody's Bond Guide.*

Junk Bonds

The investment community has labeled bonds with a Standard & Poor's rating of BB and below or a Moody's rating of Ba and below as **junk bonds.** These bonds are also called *high-yield* or *low-grade* and we shall use all three terms interchangeably. Issuance of junk bonds has grown greatly in recent years, leading to increased public interest in this form of financing.

Table 20.1 presents data on junk-bond financing in the recent past. Column (1) shows the great growth in junk-bond issuance over a 27-year period. Column (3) shows the default rate on junk bonds increased from 1.24 percent in 1971 to 10.27 percent in 1991. In 1999 the default rate was 4.1 percent. Table 20.2 presents data on default rates by Standard & Poor's on cumulative bases for 10 years. It shows that junk bonds can have a 10-year cumulative (if rated CCC) rate of 48.4 percent.

TABLE 20.1 Junk bonds: 1971–1999

Year	Par Value Outstanding (a)	Par Value Defaults	Default Rates
1999	$567,400	$23,532	4.147%
1998	$465,500	$ 7,464	1.603%
1997	$335,400	$ 4,200	1.252%
1996	$271,000	$ 3,336	1.231%
1995	$240,000	$ 4,551	1.896%
1994	$235,000	$ 3,418	1.454%
1993	$206,907	$ 2,287	1.105%
1992	$163,000	$ 5,545	3.402%
1991	$183,600	$18,862	10.273%
1990	$181,000	$18,354	10.140%
1989	$189,258	$ 8,110	4.285%
1988	$148,187	$ 3,944	2.662%
1987	$129,557	$ 7,486	5.778%
1986	$ 90,243	$ 3,156	3.497%
1985	$ 58,088	$ 992	1.708%
1984	$ 40,939	$ 344	0.840%
1983	$ 27,492	$ 301	1.095%
1982	$ 18,109	$ 577	3.186%
1981	$ 17,115	$ 27	0.158%
1980	$ 14,935	$ 224	1.500%
1979	$ 10,356	$ 20	0.193%
1978	$ 8,946	$ 119	1.330%
1977	$ 8,157	$ 381	4.671%
1976	$ 7,735	$ 30	0.388%
1975	$ 7,471	$ 204	2.731%
1974	$ 10,894	$ 123	1.129%
1973	$ 7,824	$ 49	0.626%
1972	$ 6,928	$ 193	2.786%
1971	$ 6,602	$ 82	1.242%

Source: Edward I. Altman's compilation and Salomon Smith Barney estimates.

In our opinion, the growth in junk-bond financing in the 1970s and 1980s can better be explained by the activities of one man than by a number of economic factors. While a graduate student at the Wharton School in the 1970s, Michael Milken observed a large difference between the return on high-yield bonds and the return on safer bonds. Believing that this difference was greater than what the extra default risk would justify, he concluded that institutional investors would benefit from purchases of junk bonds.

His later employment at Drexel Burnham Lambert allowed him to develop the junk-bond market. Milken's salesmanship simultaneously increased the demand for junk bonds among institutional investors and the supply of junk bonds among corporations. Corporations were particularly impressed with Drexel's vast network of institutional clients, allowing capital to be raised quickly. However, with the demise of the junk-bond market and with Michael Milken's conviction of securities fraud, Drexel found it necessary to declare bankruptcy.

The junk-bond market took on increased importance when these bonds were used to finance mergers and other corporate restructurings. Whereas a firm can only issue a small amount of high-grade debt, the same firm can issue much more debt if low-grade financing is allowed as well. Therefore, the use of junk bonds lets acquirers effect takeovers that they

In Their Own Words

Edward I. Altman on Junk Bonds

One of the most important developments in corporate finance over the last 20 years has been the reemergence of publicly owned and traded low-rated corporate debt. Originally offered to the public in the early 1900s to help finance some of our emerging growth industries, these high-yield/high-risk bonds virtually disappeared after the rash of bond defaults during the Depression. Recently, however, the junk-bond market has been catapulted from an insignificant element in the corporate fixed income market to one of the fastest growing and most controversial types of financing mechanisms.

The term *junk* emanates from the dominant type of low-rated bond issues outstanding prior to 1977 when the "market" consisted almost exclusively of original-issue investment-grade bonds that fell from their lofty status to a higher default risk, speculative-grade level. These so-called "fallen angels" amounted to about $8.5 billion in 1977. At the beginning of 1998, fallen angels comprised about 10 percent of the $450 billion publicly owned junk-bond market.

Beginning in 1977, issuers began to go directly to the public to raise capital for growth purposes. Early users of junk bonds were energy-related firms, cable TV companies, airlines, and assorted other industrial companies. The emerging growth company rationale, coupled with relatively high returns to early investors, helped legitimize this sector. Most investment banks ignored junk bonds until 1983–1984, when their merits and profit potential became more evident.

Synonymous with the market's growth was the emergence of the investment banking firm Drexel Burnham Lambert, and its junk-bond wizard, Michael Milken. Drexel established a potent network of issuers and investors and rode the wave of new financing and the consequent surge in secondary trading to become one of the powerful investment banks in the late 1980s. The incredible rise in power of this firm was followed by an equally incredible fall, resulting first in government civil and criminal convictions and huge fines for various misdealings and, finally, the firm's total collapse and bankruptcy in February 1990.

By far the most controversial aspect of junk-bond financing was its role in the corporate restructuring movement from 1985–1989. High-leverage transactions, such as leveraged buyouts (LBOs), which occur when a firm is taken private, transformed the face of corporate America, leading to a heated debate as to the economic and social consequences of corporate control changes with debt/equity ratios of at least 6:1.

These transactions involved increasingly large companies, and the multibillion dollar takeover became fairly common, capped by the huge $25 billion RJR Nabisco LBO in 1989. LBOs were typically financed with 60-percent senior bank and insurance company debt, about 25–30-percent subordinated public debt (junk bonds), and 10–15-percent equity. The junk-bond segment is sometimes referred to as "mezzanine" financing because it lies between the "balcony" senior debt and the "basement" equity.

These restructurings resulted in large fees to advisors and underwriters and huge premiums to the old shareholders, and they continued as long as the market was willing to buy these new debt offerings at what appeared to be a favorable risk/return trade-off. The bottom fell out of the market in the last six months of 1989 due to a number of factors including a marked increase in defaults, government regulation against S&Ls holding junk bonds, higher interest rates, a recession, and, finally, the growing realization of the leverage excesses of certain ill-conceived restructurings.

The default rate rose dramatically to over 4 percent in 1989 and then skyrocketed in 1990 and 1991 to over 10 percent each year, with about $19 billion of defaults in 1991. Throughout 1990, the pendulum of growth in the new junk-bond issues and returns to investors swung dramatically downward as prices plummeted and the new issue market all but dried up. The following year (1991) was a pivotal period in that despite record defaults, bond prices and new issues rebounded strongly as the prospects for the future brightened.

In the early 1990s, the financial market was questioning the very survival of the junk-bond market. The answer was a resounding "Yes," as the amount of new issuance soared to record annual levels of $38 billion in 1992 and has steadily grown to an incredible $120 billion in 1997! Coupled with plummeting annual default rates (under 2.0 percent from 1993–1997 compared to 3.5 percent for 1971–1997) and returns in these years between 10–20 percent, the risk-return characteristics have been extremely favorable. Newer dimensions of the junk-bond market include the pooling of large numbers of bonds into collateralized bond obligations (CBOs), the establishment of emerging market international issuance, and the now common use of the nonregistered 144A new issuance mechanism. The junk-bond market in the late 1990s is a quieter one compared to the 1980s, but, in terms of growth and returns, it is healthier than ever before.

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TABLE 20.2 Defaults by Original Rating—All Rated Corporate Bonds*

		(1971–1999) Years after Issuance									
		1	2	3	4	5	6	7	8	9	10
AAA	Yearly	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
AA	Yearly	0.00%	0.00%	0.36%	0.20%	0.00%	0.00%	0.00%	0.00%	0.03%	0.03%
	Cumulative	0.00%	0.00%	0.36%	0.56%	0.56%	0.56%	0.57%	0.57%	0.60%	0.62%
A	Yearly	0.00%	0.00%	0.03%	0.08%	0.04%	0.08%	0.05%	0.09%	0.07%	0.00%
	Cumulative	0.00%	0.00%	0.03%	0.11%	0.15%	0.23%	0.29%	0.38%	0.45%	0.45%
BBB	Yearly	0.07%	0.25%	0.27%	0.53%	0.32%	0.32%	0.35%	0.06%	0.06%	0.24%
	Cumulative	0.07%	0.32%	0.58%	1.12%	1.43%	1.75%	2.09%	2.15%	2.20%	2.44%
BB	Yearly	0.71%	0.81%	2.65%	1.41%	2.35%	0.80%	1.71%	0.30%	1.45%	3.03%
	Cumulative	0.71%	1.51%	4.12%	5.47%	7.69%	8.44%	10.00%	10.27%	11.58%	14.25%
B	Yearly	1.58%	3.92%	4.88%	5.78%	4.62%	3.65%	2.38%	1.77%	1.54%	0.92%
	Cumulative	1.58%	5.43%	10.05%	15.25%	19.17%	22.12%	23.98%	25.33%	26.48%	27.15%
CCC	Yearly	1.63%	13.60%	15.16%	8.27%	3.05%	8.96%	4.02%	3.36%	0.00%	3.56%
	Cumulative	1.63%	15.01%	27.89%	33.86%	36.07%	42.21%	44.53%	46.39%	46.39%	48.38%

*Rated by S & P at issuance.
Based on 802 issues.
Source: Standard & Poor's (New York) and Edward I. Altman's compilation.

could not do with only traditional bond-financing techniques. Drexel was particularly successful with this technique, primarily because their huge base of institutional clients allowed them to raise large sums of money quickly.

At this time, it is not clear how the great growth in junk-bond financing has altered the returns on these instruments. On the one hand, financial theory indicates that the expected returns on an asset should be negatively related to its marketability.[13] Because trading volume in junk bonds has greatly increased in recent years, the marketability has risen as well. This should lower the expected return on junk bonds, thereby benefiting corporate issuers. On the other hand, the increased interest in junk-bond financing by corporations (the increase in the supply schedule of junk bonds) is likely to raise the expected returns on these assets. The net effect of these two forces is unclear.[14]

Junk-bond financing has recently created much controversy. First, because the use of junk bonds increases the firm's interest deduction, Congress and the IRS have registered strong disapproval. Several legislators have suggested denying interest deductibility on

[13]For example, see Y. Amihud and H. Mendelson, "Asset Pricing and the Bid-Ask Spread," *Journal of Financial Economics* (December 1986).

[14]The actual risk of junk bonds is not known with certainty because it is not easy to measure default rate. Paul Asquith, David W. Mullins, Jr., and Eric D. Wolff, "Original Issue High Yield Bonds: Aging Analysis of Defaults, Exchanges, and Calls," *Journal of Finance* (September 1989), show that the default rate on junk bonds can be greater than 30 percent over the life of the bond. They look at cumulative default rates and find that of all junk bonds issued in 1977 and 1978, 34 percent had defaulted by December 31, 1988. Table 20.1 shows yearly default rates. Edward I. Altman, "Setting the Record Straight on Junk Bonds: A Review of the Research on Default Rates and Returns," *Journal of Applied Corporate Finance* (Summer 1990), shows that yearly default rates of 5 percent are consistent with cumulative default rates of over 30 percent.

TABLE 20.3 Average Gross Spreads and Total Direct Costs for Domestic Debt Issues: 1990–94

	Convertible Bonds						Straight Bonds					
	Investment Grade			Noninvestment Grade			Investment Grade			Noninvestment Grade		
Proceeds ($ in millions)	Number of Issues	Gross Spread	Total Direct Cost	Number of Issues	Gross Spread	Total Direct Cost	Number of Issues	Gross Spread	Total Direct Cost	Number of Issues	Gross Spread	Total Direct Cost
2– 9.99	0	—	—	0	—	—	14	.58%	2.19%	0	—	—%
10– 19.99	0	—	—	1	4.00%	5.67%	56	.50	1.19	2	5.13%	7.41%
20– 39.99	1	1.75%	2.75%	9	3.29	4.92	64	.86	1.48	9	3.11	4.42
40– 59.99	3	1.92	2.43	19	3.37	4.58	78	.47	.94	9	2.48	3.35
60– 79.99	4	1.31	1.76	41	2.76	3.37	49	.61	.98	43	3.07	3.84
80– 99.99	2	1.07	1.34	10	2.83	3.48	65	.66	.94	47	2.78	3.75
100– 199.99	20	2.03	2.33	37	2.51	3.00	181	.57	.81	222	2.75	3.44
200– 499.99	17	1.71	1.87	10	2.46	2.70	60	.50	.93	105	2.56	2.96
500 and up	3	2.00	2.09	0	—	—	11	.39	.57	9	2.60	2.90
Total	50	1.81%	2.09%	127	2.81%	3.53%	578	.58%	.94%	446	2.75%	3.42%

Source: Inmoo Lee, Scott Lochhead, Jay Ritter, and Quanshui Zhao, "The Costs of Raising Capital," *Journal of Financial Research* 1 (Spring 1996).

junk bonds, particularly when the bonds are used to finance mergers. Second, the media has focused on the effect of junk-bond financing on corporate solvency. Clearly, this form of financing permits the possibility of higher debt-equity ratios. Whether or not this increased leverage will lead to wholesale defaults in an economic downturn, as some commentators have suggested, remains to be seen. Third, the recent wave of mergers has often resulted in dislocations and loss of jobs. Because junk-bond financing has played a role in mergers, it has come under much criticism. The social policy implications of mergers are quite complex, and any final judgment on them is likely to be reserved for the distant future. At any rate, junk-bond financing should not be implicated too strongly in either the social benefits or the social costs of the recent wave of mergers. Perry and Taggart point out that, contrary to popular belief, this form of financing accounts for only a few percent of all mergers.[15]

We discussed the costs of issuing securities in Chapter 19 and established that the costs of issuing debt are substantially less than the costs of issuing equity. Table 20.3 clarifies several questions regarding the costs of issuing debt securities. It contains a breakdown of direct costs for bond issues after the investment and noninvestment grades have been separated.

First, there are substantial economies of scale here as well. Second, investment-grade issues have much lower direct costs, particularly for straight bonds. Finally, there are relatively few noninvestment-grade issues in the smaller size categories, reflecting the fact that such issues are more commonly handled as private placements, which we discuss in a later section.

CONCEPT QUESTIONS ?

- List and describe the different bond-rating classes.
- Why don't bond prices change when bond ratings change?
- Are the costs of bond issues related to their ratings?

20.5 Some Different Types of Bonds

Until now we have considered "plain vanilla" bonds. In this section we look at some more unusual types: floating-rate bonds, deep-discount bonds, and income bonds.

Floating-Rate Bonds

The conventional bonds we have discussed in this chapter have *fixed-dollar obligations.* That is, the coupon rate is set as a fixed percentage of the par value.

With **floating-rate bonds,** the coupon payments are adjustable. The adjustments are tied to an *interest-rate index* such as the Treasury-bill interest rate or the 30-year Treasury-bond rate. For example, in 1974 Citibank issued $850 million of floating-rate notes maturing in 1989. The coupon rate was set at 1 percent above the 90-day Treasury-bill rate and adjusted semiannually.

In most cases the coupon adjusts with a lag to some base rate. For example, suppose a coupon-rate adjustment is made on June 1. The adjustment may be from a simple average of yields on six-month Treasury bills issued during March, April, and May. In addition, the majority of these *floaters* have put provisions and floor-and-ceiling provisions:

1. With a *put provision* the holder has the right to redeem his or her note at par on the coupon payment date. Frequently, the investor is prohibited from redeeming at par during the first few years of the bond's life.
2. With floor-and-ceiling provisions the coupon rate is subject to a minimum and maximum. For example, the minimum coupon rate might be 8 percent and the maximum rate might be 14 percent.

[15] K. Perry and R. Taggart, "The Growing Role of Junk Bonds in Corporate Finance," *Journal of Applied Corporate Finance* (Spring 1988).

The popularity of floating-rate bonds is connected to *inflation risk.* When inflation is higher than expected, issuers of fixed-rate bonds tend to make gains at the expense of lenders, and when inflation is less than expected, lenders make gains at the expense of borrowers. Because the inflation risk of long-term bonds is borne by both issuers and bondholders, it is in their interests to devise loan agreements that minimize inflation risk.[16]

Floaters reduce inflation risk because the coupon rate is tied to the current interest rate, which, in turn, is influenced by the rate of inflation. This can most clearly be seen by considering the formula for the present value of a bond. As inflation increases the interest rate (the denominator of the formula), inflation increases a floater's coupon rate (the numerator of the formula). Hence, bond value is hardly affected by inflation. Conversely, the coupon rate of fixed-rate bonds cannot change, implying that the prices of these bonds are at the mercy of inflation.

As an alternative, an individual who is concerned with inflation risk can invest in short-term notes, such as Treasury bills, and *roll them over.*[17] The investor can accomplish essentially the same objective by buying a floater that is adjusted to the Treasury-bill rate. However, the purchaser of a floater can reduce transactions costs relative to rolling over short-term Treasury bills because floaters are long-term bonds. The same type of reduction in transactions costs makes floaters attractive to some corporations.[18] They benefit from issuing a floater instead of issuing a series of short-term notes.

In an earlier section, we discussed callable bonds. Because the coupon on floaters varies with marketwide interest rates, floaters always sell at or near par. Therefore, it is not surprising that floaters do not generally have call features.

Deep-Discount Bonds

A bond that pays no coupon must be offered at a price that is much lower than its face value. Such bonds are known as **original-issue discount bonds, deep-discount bonds, pure-discount bonds,** or **zero-coupon bonds.** They are frequently called *zeros* for short.

Suppose the DDB Company issues $1,000 of five-year deep-discount bonds when the marketwide interest rate is 10 percent. These bonds do not pay any coupons. The initial price is set at $621 because $\$621 = \$1{,}000/(1.10)^5$.

Because these bonds have no intermediate coupon payments, they are quite attractive to certain investors and quite unattractive to others. For example, consider an insurance company forecasting death-benefit payments of $1,000,000 five years from today. The company would like to be sure that it will have the funds to pay off the liability in five years' time. The company could buy five-year zero-coupon bonds with a face value of $1,000,000. The company is matching assets with liabilities here, a procedure that eliminates interest-rate risk. That is, regardless of the movement of interest rates, the firm's set of zeros will always be able to pay off the $1,000,000 liability.

Conversely, the firm would be at risk if it bought coupon bonds instead. For example, if it bought five-year coupon bonds, it would need to reinvest the coupon payments through to the fifth year. Because interest rates in the future are not known with certainty today, one cannot be sure if these bonds will be worth more or less than $1,000,000 by the fifth year.

Now, consider a couple saving for their child's college education in 15 years. They *expect* that, with inflation, four years of college should cost $150,000 in 15 years. Thus, they

[16]See B. Cornell, "The Future of Floating Rate Bonds," in *The Revolution in Corporate Finance,* ed. by J. M. Stern and D. H. Chew, Jr. (New York: Basil Blackwell, 1986).

[17]That is, the investor could buy a bill, receive the face value at maturity, use these proceeds to buy a second bill, receive the face value from the second bill at maturity, and so on.

[18]Cox, Ingersoll, and Ross developed a framework for pricing floating-rate notes; see J. Cox, J. Ingersoll, and S. A. Ross, "An Analysis of Variable Rate Loan Contracts," *Journal of Finance* 35 (May 1980).

buy 15-year zero-coupon bonds with a face value of $150,000.[19] If they have forecasted inflation perfectly (and if college costs keep pace with inflation), their child's tuition will be fully funded. However, if inflation rises more than expected, the tuition would be more than $150,000. Because the zero-coupon bonds produce a shortfall, the child might end up working his way through school. As an alternative, the parents might have considered rolling over Treasury bills. Because the yields on Treasury bills rise and fall with the inflation rate, this simple strategy is likely to cause less risk than the strategy with zeros.

The key to these examples concerns the distinction between nominal and real quantities. The insurance company's liability is $1,000,000 in *nominal* dollars. Because the face value of a zero-coupon bond is a nominal quantity, the purchase of zeros eliminates risk. However, it is easier to forecast college costs in real terms than in nominal terms. Thus, a zero-coupon bond is a poor choice to reduce the financial risk of a child's college education.

Income Bonds

Income bonds are similar to conventional bonds, except that coupon payments are dependent on company income. Specifically, coupons are paid to bondholders only if the firm's income is sufficient.

Income bonds are a financial puzzle because, from the firm's standpoint, they appear to be a cheaper form of debt than conventional bonds. Income bonds provide the same tax advantage to corporations from interest deductions that conventional bonds do. However, a company that issues income bonds is less likely to experience financial distress. When a coupon payment is omitted because of insufficient corporate income, an income bond is not in default.

Why don't firms issue more income bonds? Two explanations have been offered:

1. *The "Smell of Death" Explanation.* Firms that issue income bonds signal the capital markets of their increased prospect of financial distress.
2. *The "Dead-Weight Costs" Explanation.* The calculation of corporate income is crucial to determining the status of bondholders' income, and stockholders and bondholders will not necessarily agree on how to calculate the income. This creates agency costs associated with the firm's accounting methods.

Although these are possibilities, the work of McConnell and Schlarbaum suggests that no truly satisfactory reason exists for the lack of more investor interest in income bonds.[20]

CONCEPT QUESTION ?

- Create an idea of an unusual bond and analyze its features.

20.6 Direct Placement Compared to Public Issues

Earlier in this chapter, we described the mechanics of issuing debt to the public. However, more than 50 percent of all debt is privately placed. There are two basic forms of direct private long-term financing: term loans and private placement.

Term loans are direct business loans with maturities of between 1 year and 15 years. The typical term loan is amortized over the life of the loan. That is, the loan is repaid by equal

[19] A more precise strategy would be to buy zeros maturing in years 15, 16, 17, and 18, respectively. In this way, the bonds might mature just in time to meet tuition payments.

[20] J. McConnell and G. Schlarbaum, "The Income Bond Puzzle," in *The Revolution in Corporate Finance.* ed. by J. M. Stern and D. H. Chew, Jr. (New York: Basil Blackwell, 1986).

annual payments of interest and principal. The lenders are commercial banks and insurance companies. A **private placement,** which also involves the sale of a bond or loan directly to a limited number of investors, is very similar to a term loan except that the maturity is longer.

Some important differences between direct long-term financing and public issues are:

1. A direct long-term loan avoids the cost of registration with the Securities and Exchange Commission.
2. Direct placement is likely to have more restrictive covenants.
3. It is easier to renegotiate a term loan and a private placement in the event of a default. It is harder to renegotiate a public issue because hundreds of holders are usually involved.
4. Life insurance companies and pension funds dominate the private-placement segment of the bond market. Commercial banks are significant participants in the term-loan market.
5. The costs of distributing bonds are lower in the private market.

The interest rates on term loans and private placements are usually higher than those on an equivalent public issue. Hayes, Joehnk, and Melicher found that the yield to maturity on private placements was 0.46 percent higher than on similar public issues.[21] This finding reflects the trade-off between a higher interest rate and more flexible arrangements in the event of financial distress, as well as the lower transaction costs associated with private placements.

CONCEPT QUESTIONS ?

- What are the differences between private and public bond issues?
- A private placement is more likely to have restrictive covenants than is a public issue. Why?

20.7 LONG-TERM SYNDICATED BANK LOANS

Most bank loans are for less than a year. They serve as a short-term "bridge" for the acquisition of inventory and are typically self-liquidating—that is, when the firm sells the inventory, the cash is used to repay the bank loan. We talk about the need for short-term bank loans in the next section of the text. Now we focus on long-term bank loans.

First, we introduce the concept of commitment. Most bank loans are made with a commitment to a firm. That commitment establishes a line of credit and allows the firm to borrow up to a predetermined limit. Most commitments are in the form of a revolving credit commitment (i.e., a revolver) with a fixed term of up to three years or more. Revolving credit commitments are drawn or undrawn depending on whether the firm has a current need for the funds.

Now we turn to the concept of syndication. Very large banks such as Citigroup typically have a larger demand for loans than they can supply, and small regional banks frequently have more funds on hand than they can profitably lend to existing customers. Basically, they cannot generate enough good loans with the funds they have available. As a result, a very large bank may arrange a loan with a firm or country and then sell portions of it to a syndicate of other banks. With a syndicated loan, each bank has a separate loan agreement with the borrowers.

A syndicated loan is a corporate loan made by a group (or syndicate) of banks and other institutional investors. A syndicated loan may be publicly traded. It may be a line of credit and be "undrawn" or it may be drawn and be used by a firm. Syndicated loans are always rated investment grade. However, a *leveraged* syndicated loan is rated speculative grade (i.e., it is "junk"). Every week, *The Wall Street Journal* reports on the number of syndicated

[21] P. A. Hayes, M. D. Joehnk, and R. W. Melicher, "Determinants of Risk Premiums in the Public and Private Bond Market," *Journal of Financial Research* (Fall 1979).

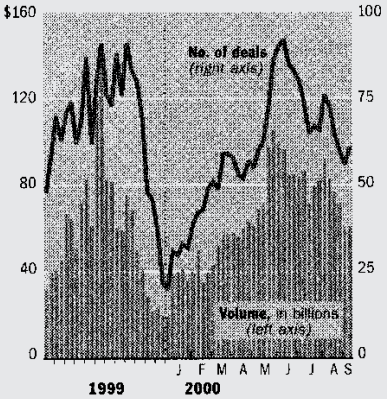
■ TABLE 20.4
Syndicated Loans/*Trends & Prices*

Syndicated Loans / *Trends & Prices*

Syndicated loans are corporate loans made by a group, or syndicate, of banks and institutional investors. 'Undrawn' loans are lines of credit made available to corporations as backing for commercial paper or for general corporate purposes. A basis point is 1/100th of a percentage point.

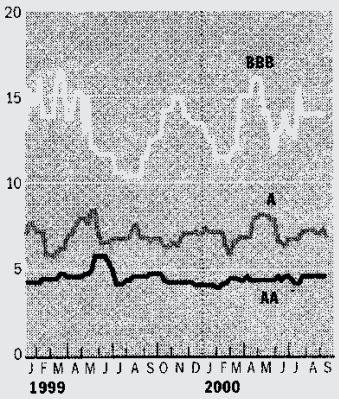
Deal Flow

A leading indicator of activity, showing new deals mandated or in the market. Deals tallied are transactions priced at or below Libor+150 basis points.



Credit Costs

Average new-issue fees paid by investment-grade issuers on undrawn loans*; in basis points, by credit rating of issuer.



*These loans are assumed to be 100% undrawn. Fees include the facility fee, paid to have a line of credit open and/or the commitment fee, paid to retain the portion of the money that's undrawn.

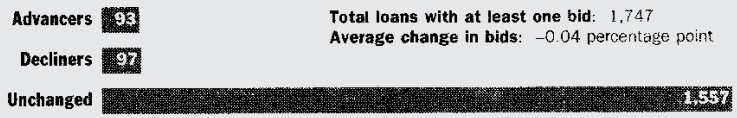
The Week's Biggest Movers

Biggest gainers and losers among widely-quoted syndicated loans in secondary trading, in the week ended Monday. Listed are the biggest movers among the 105 loans with at least five bids. All loans listed are B-term, or sold to institutional investors.

	LOAN RATING MOODY'S/S&P	COUPON	MATURITY	AVERAGE BID (pct. pts.)	WEEKLY CHANGE (pct. pts.)
Adelphia Commun.	Ba3/N.R.*	L+250	March 21, '09	99.93	+0.07
Allied Waste	Ba3/BB	L+275	July 1, '06	95.86	+0.16
Casella Waste Sys.	B1/BB–	L+350	Jan. 26, '07	99.05	+1.55
Federal-Mogul	Ba2/BB	L+225	Dec. 18, '05	92.79	–0.04
Global Crossing	Ba1/BBB–	L+275	July 6, '06	100.38	+0.04
Huntsman Pkg.	B1/BB–	L+300	April 15, '08	97.34	–0.14
Integrated Health	N.R.*/N.R.*	L+200	Sept. 30, '04	27.67	–0.17
Kansas City So. Rail	Ba1/BB+	L+350	Dec.17, '06	100.29	+0.05
Laidlaw/Safety-Kleen	N.R./CC	L+312.5	May 15, '04	30.57	–0.43
Lincoln Electric	Ba3/BB+	L+300	May 30, '08	100.55	+0.05
Magellan Health	B2/B+	L+250	Feb. 12, '05	85.67	+0.50
McLeod	Ba2/BB–	L+300	April 12, '08	100.04	+0.05
Nextel Finance	Ba2/BB–	L+337.5	April 10, '08	100.44	+0.07

	LOAN RATING MOODY'S/S&P	COUPON	MATURITY	AVERAGE BID (pct. pts.)	WEEKLY CHANGE (pct. pts.)
Nextlink	B1/B+	L+350	June 30, '07	99.32	+0.05
Pillowtex	B3/CCC	L+275	Dec. 31, '04	68.38	+0.13
Safelite Glass	Caa1/D	L+200	Dec. 29, '04	41.25	+0.25
Superior TeleCom	Ba3/B+	L+375	Nov. 27, '05	98.89	–0.04
Tenneco Auto.	Ba3/BB	L+275	August 5, '07	98.82	–0.17
Thermadyne	B1/B	L+275	May 22, '05	92.90	–0.2
Total Renal Care	B1/B+(a)	L+375	March 31, '08	96.30	+0.20
U.S. Office Prod.	Caa1/CCC+	L+250	April 22, '06	58.75	–2
VenTrust-Ventas	N.R.*/N.R.*	L+375	Dec. 31, '05	89.00	+1.50
Voicestream Wriss	B1/B+	L+350	Jan. 31, '09	99.49	+0.05
Winstar Commun.	B2/B+	L+400	Sept. 10, '07	97.05	–0.34
Wyndham Intl.		L+350	June 18, '06	98.49	+0.28

*Not rated



Total loans with at least one bid: 1,747
Average change in bids: –0.04 percentage point

Note: These are the averages of indicative bid prices provided by bank-loan traders, excluding the highest bid and expressed as a percentage of the par, or face, value. Coupon, or interest rate, is in 1/100s of a percentage point over Libor, the benchmark London Interbank Offered Rate. All ratings are for specific loans and not for the company itself except as noted with an (a). These prices do not represent actual trades nor are they offers to trade; rather they are estimated values provided by dealers.

loan deals, credit costs, and yields, as seen in Table 20.4. In addition, syndicated loan prices are reported for a group of publicly traded loans. Altman and Suggitt report slightly higher default rates for syndicated loans when compared to comparable corporate bonds.[22]

20.8 Summary and Conclusions

This chapter describes some important aspects of long-term debt financing.

1. The written agreement describing the details of the long-term debt contract is called an *indenture.* Some of the main provisions are security, repayment, protective covenants, and call provisions.
2. There are many ways that shareholders can take advantage of bondholders. Protective covenants are designed to protect bondholders from management decisions that favor stockholders at bondholders' expense.
3. Unsecured bonds are called *debentures* or *notes.* They are general claims on the company's value. Most public industrial bonds are unsecured. In contrast, utility bonds are usually secured. Mortgage bonds are secured by tangible property, and collateral trust bonds are secured by financial securities such as stocks and bonds. If the company defaults on secured bonds, the trustee can repossess the assets. This makes secured bonds more valuable.
4. Long-term bonds usually provide for repayment of principal before maturity. This is accomplished by a sinking fund. With a sinking fund, the company retires a certain number of bonds each year. A sinking fund protects bondholders because it reduces the average maturity of the bond, and its payment signals the financial condition of the company.
5. Most publicly issued bonds are callable. A callable bond is less attractive to bondholders than a noncallable bond. A callable bond can be bought back by the company at a call price that is less than the true value of the bond. As a consequence, callable bonds are priced to obtain higher stated interest rates for bondholders than noncallable bonds.

   Generally, companies should exercise the call provision whenever the bond's value is greater than the call price.

   There is no single reason for call provisions. Some sensible reasons include taxes, greater flexibility, management's ability to predict interest rates, and the fact that callable bonds are less sensitive to interest-rate changes.
6. There are many different types of bonds, including floating-rate bonds, deep-discount bonds, and income bonds. This chapter also compares private placement with public issuance.

Key Terms

Bearer 566
Call premium 568
Call-protected 568
Debenture 567
Deep-discount bonds 579
Deferred call 568
Floating-rate bonds 578
Income bonds 580
Indenture 564
Junk bonds 573
Negative covenant 567
Original-issue discount bonds 579
Positive covenant 567
Private placement 581
Protective covenant 567
Public issue 564
Pure-discount bonds 579
Refunding 568
Zero-coupon bonds 579

[22]Edward I. Altman and Heather J. Suggitt, "Default Rates in the Syndicated Bank Loan Market: A Longitudinal Analysis," *Journal of Banking and Finance* 24 (2000).

Suggested Reading

The following provides a complete coverage of bonds and the bond market:

Fabozzi, F. J., and T. D. Fabozzi, eds. *The Handbook of Fixed Income Securities.* 4th ed. Homewood, Ill.: Irwin Professional Publishing, 1995.

Questions and Problems

The Public Issue of Bonds

20.1 Raeo Corp. bonds trade at 100 today. The bonds pay semiannual interest that is paid on January 1 and July 1. The coupon on the bonds is 10 percent. How much will you pay for a Raeo bond if today is
- *a.* March 1.
- *b.* October 1.
- *c.* July 1.
- *d.* August 15.

20.2 Define the following terms:
- *a.* Protective covenant
- *b.* Negative covenant
- *c.* Positive covenant
- *d.* Sinking fund

20.3 Sinking funds have both positive and negative characteristics to the bondholders. Why?

20.4 Which is riskier to a prospective creditor, an open-end mortgage or closed-end mortgage? Why?

20.5 What is call premium? During what period of time is a bond said to be call-protected?

Bond Refunding

20.6 KIC, Inc., plans to issue $5 million of perpetual bonds. The face value of each bond is $1,000. The annual coupon on the bonds is 12 percent. Market interest rates on one-year bonds are 11 percent. With equal probability, the long-term market interest rate will be either 14 percent or 7 percent next year. Assume investors are risk-neutral.
- *a.* If the KIC bonds are noncallable, what is the price of the bonds?
- *b.* If the bonds are callable one year from today at $1,450, will their price be greater than or less than the price you computed in part (*a*)? Why?

20.7 Bowdeen Manufacturing intends to issue callable, perpetual bonds. The bonds are callable at $1,250. One-year interest rates are 12 percent. There is a 60-percent probability that long-term interest rates one year from today will be 15 percent. With a 40-percent probability, long-term interest rates will be 8 percent. To simplify the firm's accounting, Bowdeen would like to issue the bonds at par ($1,000). What must the coupon on the bonds be for Bowdeen to be able to sell them at par?

20.8 Illinois Industries has decided to borrow money by issuing perpetual bonds. The face value of the bonds will be $1,000. The coupon will be 8 percent, payable annually. The one-year interest rate is 8 percent. It is known that next year there is a 65-percent chance that interest rates will decline to 6 percent, and that there is a 35-percent chance that they will rise to 9 percent.
- *a.* What will the market value of these bonds be if they are noncallable?
- *b.* If the company instead decides to make the bonds callable, what coupon will be demanded by the bondholders for the bonds to sell at par? Assume that the bonds can be called in one year (i.e., the call date is one year from now) and that the call premium is equal to the annual coupon.
- *c.* What will be the value of the call provision to Illinois Industries?

20.9 New Business Ventures, Inc., has an outstanding perpetual bond with a face value equal to $1,000 and a 9-percent coupon rate. The bond cannot be called for one year. The call premium is set at $150 over par value. It is forecasted that there is a 40-percent chance that the interest rate will rise to 12-percent, and a 60-percent chance that the interest rate will fall down to 6 percent next year. The current interest rate is 10 percent. What is the current market price of this callable bond?

20.10 Hudson River Electronics has $500 million of 9-percent perpetual bonds outstanding. These bonds can be called at a price of $1,090 for each $1,000 of face value. Under present market conditions, the outstanding bonds can be replaced by $500 million of 7-percent perpetual bonds. The underwriting and legal expenses of this new issue would be $80 million. What would be the net present value of this refunding? Assume that there are no taxes.

20.11 An outstanding issue of Public Express Airlines debentures has a call provision attached. The total principal value of the bonds is $250 million, and the bonds pay an annual coupon of $80 for each $1,000 of face value. The total cost of refunding would be 12 percent of the principal amount raised. The appropriate tax rate for the company is 35 percent. How low does the borrowing cost of Public Express need to drop to justify refunding with a new bond issue?

20.12 Margret Kimberly, CFO of Charles River Associates, is considering whether or not to refinance the two currently outstanding corporate bonds of the firm. The first one is an 8-percent perpetual bond with a $1,000 face value with $75 million outstanding. The second one is a 9-percent perpetual bond with the same face value with $87.5 million outstanding. The call premiums for the two bonds are 8.5 percent and 9.5 percent of the face value, respectively. The transaction costs of the refundings are $10 million and $12 million, respectively. The current interest rates for the two bonds are 7 percent and 7.25 percent, respectively. Which bond should Ms. Kimberly recommend be refinanced? What is the NPV of the refunding?

Some Different Types of Bonds

20.13 What is a "junk bond"? What are some of the controversies created by junk-bond financing?

20.14 Describe the following types of bonds:

a. Floating rate
b. Deep discount
c. Income

Direct Placement Compared to Public Issues

20.15 Which of the following are characteristics of public issues, and which are characteristics of direct financing?

a. SEC registration required
b. Higher interest cost
c. Higher fixed cost
d. Quicker access to funds
e. Active secondary market
f. Easily renegotiated
g. Lower flotation costs
h. Regular amortization required
i. Ease of repurchase at favorable prices
j. High total cost to small borrowers
k. Flexible terms
l. Less intensive investigation required

General Topics

20.16 *a.* In an efficient market callable and noncallable bonds will be priced in such a way that there will be no advantage or disadvantage to the call provision. Comment.

b. If interest rates fall, will the price of noncallable bonds move up higher than that of callable bonds? Why or why not?