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14

Corporate Bonds, Preferred Stock, and Leasing

“The borrower is servant to the lender.”

—Proverbs 22:7

Kuwaiti Corporation Issues Bonds Denominated in Euros

In May 2006 Gulf Investment Corporation (GIC) issued 400 million euros worth of bonds. This corporate bond issue was the first by this Kuwait-based company to be denominated in euros, the currency of the European Monetary Union. This had a dollar value of about 510 million.

At the time of this bond sale, GIC had total assets of over \$7 billion. The lead underwriters for these five-year bonds were ABN, AMRO, and UBS. The issue was oversubscribed. European investors bought 45 percent of the bonds and Asian investors bought 30 percent. Gulf country investors bought the rest.

Bond markets are global. Bonds are issued all over the world in a variety of currencies, sometimes in currencies other than that of the home country of the issuer. Even though the dinar is its currency, Kuwait chose to issue bonds denominated in euros. In this chapter we examine bonds, preferred stock, and leasing by corporations.

Sources: <http://www.eubusiness.com/Finance/060529105522.oilc3pf>, 6/11/06, http://www.gulf-daily-new.com/1yr_arc_Articles.asp?Article=144833&Sn=BUSI&IssueID=29071&date=5-30-2006, 6/11/06.

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Chapter Overview

In Chapter 2, we examined the basic characteristics and terminology of corporate bonds. In Chapter 12, we learned how to estimate the value of bonds. In this chapter we investigate how corporate bonds and preferred stock play a role in the financing decisions of a corporation. We also explore how leasing decisions affect a firm's finances.

Bond Basics

A **corporate bond** is a security that represents a promise by the issuing corporation to make certain payments to the owner of the bond, according to a certain schedule. The corporation that issues a bond is the debtor, and the investor who buys the bond is the creditor.

The **indenture** is the contract between the issuing corporation and the bond's purchaser. It spells out the various provisions of the bond issue, including the face value, coupon interest rate, interest payment dates, maturity date, and other details. The yield to maturity is not in the indenture because it is market determined and changes with market conditions. The major features of bond indentures are described in the next section.

The investment bankers who underwrite the new bond issue help the firm set the terms of that issue. This usually means obtaining a rating for the bonds from one or more of the major rating companies, such as Moody's and Standard & Poor's. Bond ratings shown in Table 14-1 reflect the likelihood that the issuer will make

Learning Objectives

After reading this chapter, you should be able to:

1. Describe the contract terms of a bond issue.
2. Distinguish the various types of bonds and describe their major characteristics.
2. Describe the key features of preferred stock.
3. Compare and contrast a genuine lease and a disguised purchase contract.
4. Explain why some leases must be shown on the balance sheet.

Table 14-1 Moody's and Standard & Poor's Bond Rating Categories

Moody's	Standard & Poor's	Remarks
Aaa	AAA	Best Quality
Aa1	AA+	
Aa2	AA	High Quality
Aa3	AA2	
A1	A+	
A2	A	Upper Medium Grade
A3	A2	
Baa1	BBB+	
Baa2	BBB	Medium Grade
Baa3	BBB2	
Ba1	BB+	
Ba2	BB	Speculative
Ba3	BB2	
B1	B+	
B2	B	Very Speculative
B3	B2	
Caa	CCC	
Ca	CC	Very, Very Speculative
C	C	
	D	In Default



Interactive Module

Go to Downloadable Companion Material, chapter 14. Follow the instructions there. Read about bond quotes and bond ratings.

the promised interest and principal payments on time. Many institutional investors, the main purchasers of bonds, are prohibited, either by law or by client demands, from purchasing unrated bonds.

Bonds rated Baa3 or above by Moody's and BBB2 or above by Standard & Poor's are called **investment-grade bonds**. Bonds with lower than investment-grade ratings (Ba1 or below by Moody's and BB+ or below by Standard & Poor's) are called **junk bonds**. We'll have more to say about junk bonds later in the chapter.

Features of Bond Indentures

In addition to the basic characteristics of the bond (interest, principal, maturity, and specific payment dates), the bond indenture specifies other features of the bond issue. These features include:

- Any security to be turned over to the bond's owner in the event the issuing corporation defaults
- The plan for paying off the bonds at maturity
- Any provisions for paying off the bonds ahead of time

- Any restrictions the issuing company places on itself to provide an extra measure of safety to the bondholder
- The name of an independent trustee to oversee the bond issue

Thus, every key feature of the bond issue is spelled out in the bond indenture.

Security

A person who buys a newly issued bond is, in effect, lending money to the issuing corporation for a specified period of time. Like other creditors, bondholders are concerned about getting their money back. A provision in the loan agreement (the indenture) that provides security¹ to the lender in case of default will increase the bond's value, compared with a loan agreement without a security provision. The value of the bond is higher because the investor has an extra measure of protection. A bond that has a security provision in the indenture is a **secured bond**. A bond that does not pledge any specific asset(s) as security is a **debenture**. Debentures are backed only by the company's ability and willingness to pay.

Plans for Paying Off Bond Issues

Bonds are paid off, or retired, by a variety of means. Some of the more popular methods include *staggered maturities*, *sinking funds*, and *call provisions*.

Staggered Maturities Some bond issues are packaged as a series of different bonds with different or staggered maturities. Every few years a portion of the bond issue matures and is paid off. Staggering maturities in this fashion allows the issuing company to retire the debt in an orderly fashion without facing a large one-time need for cash, as would be the case if the entire issue were to mature at once. **Serial payments** pay off bonds according to a staggered maturity schedule.

Sinking Funds Although *sinking* is not an appealing word, sending your debt to the bottom of the ocean has its appeal. When a sinking fund provision is included in the bond's indenture, the issuing company makes regular contributions² to a fund that is used to buy back outstanding bonds. Putting aside a little money at a time in this fashion ensures that the amount needed to pay off the bonds will be available.

Call Provisions Many corporate bonds have a provision in their indentures that allows the issuing corporation to pay off the bonds before the stated maturity date, at some stated price. This is known as a **call provision**. The price at which the bonds can be purchased before the scheduled maturity date is the call price.

Call provisions allow issuing corporations to refinance their debt if interest rates fall, just as homeowners refinance their mortgage loans when interest rates fall. For example, a company that issued bonds in 2006 with a 9 percent coupon interest rate

¹Chapter 2 used a different definition of security (a financial claim such as a stock or bond). Security has another definition, as used here. This definition is any asset (such as a piece of equipment, real estate, or a claim on future profits) that is promised to the investor in the event of a default.

²These are called "contributions" in the same sense that the government refers to the money you pay into the Social Security system as contributions. You have no choice; you must pay. If a company fails to make its required contributions to a sinking fund as described in the indenture, the bond issue can be declared to be in default.

would be making annual interest payments of 9 percent of \$1,000, or \$90 on each bond. Suppose that in 2007 the market rate of the company's bonds were to fall to 7 percent. If the bond indenture contained a call provision,³ the company could issue 7 percent bonds in 2007 and use the proceeds from the issue to "call in" or pay off the 9 percent bonds. The company's new interest payments would be only 7 percent of \$1,000, or \$70, thus saving the company \$20 on each bond each year.

When bonds are called, convention is that the call price the issuer must pay is generally more than the face value. This excess of the call price over the face value is known as the **call premium**. The call premium may be expressed as a dollar amount or as a percentage of par.

Issuing new bonds to replace old bonds is known as a **refunding** operation. Remember, the option to call a bond is held by the issuing corporation. The owners of the bonds have no choice in the matter. If investors don't turn in their bonds when the bonds are called, they receive no further interest payments.

A company approaches a bond refunding the same way it does any capital budgeting decision. The primary incremental cash inflows come from the interest savings realized when old high-interest debt is replaced with new low-interest debt. The primary incremental cash outflows are the call premium, if any, and the flotation costs associated with the new bond issue. All these variables must be adjusted for taxes and then evaluated by the firm. If the net present value of the incremental cash flows associated with the refunding is greater than or equal to zero, the refunding is done. If the NPV is negative, the company allows the old bonds to remain outstanding. This is the same thing you do when deciding whether to refinance a mortgage loan on a home.

Occasionally, a corporation will refund a bond issue even though there are no significant interest savings to be had. If the outstanding bonds have indenture provisions that the issuing company now finds oppressive or too limiting, the old bonds could be called and new bonds issued without the offending features. Let's go through a typical bond refunding decision.

A Sample Bond Refunding Problem

Suppose the Mega-Chip Corporation has \$50 million worth of bonds outstanding with an annual coupon interest rate of 10 percent. However, market interest rates have fallen to 8 percent since the bonds were issued five years ago. Accordingly, the Mega-Chip Corporation would like to replace the old 10 percent bonds with a new issue of 8 percent bonds. In so doing, the firm could save $2 \text{ percent} \times \$50 \text{ million} = \$1 \text{ million}$ a year in interest payments. The original maturity of the 10 percent bonds was 20 years. The relevant financial data are summarized in Table 14-2.

The Mega-Chip Corporation will be issuing new bonds having the same maturity as the number of years remaining to maturity on the old bonds (15 years). The call premium on the old bonds is the amount specified in the original bond indenture that the company must pay the bond owners if the bonds are called. The call premium is expressed as a percentage of the bond's face value. Thus, in this case, Mega-Chip will have to pay the old bondholders 5 percent of \$50 million, or \$2.5 million, in addition to the face value of the bonds, if it calls the bonds in.

³If a bond issue is callable, there is usually a certain amount of time that must pass before the bonds can be called. This is known as a deferred call provision. The indenture specifies the call date. The issuer can call bonds in from investors on, or after, this call date.

Table 14-2 Mega-Chip Bond Refunding Problem

Old Bond Issue:	\$50,000,000; 10% annual interest rate; interest paid annually; 20 years original maturity. 15 years emaining to maturity
Call Premium on Old Bond:	5%
Underwriting Costs on Old Bonds When Issued 5 Years Ago:	2% of amount issued
New Bond Issue:	\$50,000,000; 8% annual interest rate; interest paid semiannually; 15 years to maturity
Underwriting Costs on New Bonds:	3% of amount issued
Marginal Tax Rate:	40%
After-Tax Cost of Debt:	AT kd = 4.8%

The amount of the underwriting costs and the interest savings realized as a result of the refund are numbers that are essentially certain, so a very low discount rate is called for in this capital budgeting problem. The usual custom is to use the after-tax cost of debt for the discount rate. In this case the number is 4.8 percent.⁴

The calculations for this refunding capital budgeting problem are shown in Table 14-3.

The cash outflows in Table 14-3 are fairly straightforward. The 5 percent call premium on the old bonds and the 3 percent underwriting costs on the new bonds add up to a total outflow of \$4 million.

The cash inflows are more complicated. There is an annual interest savings of \$1 million per year for 15 years. This amounts to \$600,000 after taxes. The present value of these after-tax annual savings is \$6,312,840, using the after-tax cost of debt of 4.8 percent as the discount rate. The tax savings on the call premium paid on the old bonds is \$701,426.70. The tax deductions from the underwriting costs on the old bonds were amortized over the original 20-year scheduled life of the bond. Thus, if the bonds are called now, the entire balance of the underwriting costs not yet claimed as a tax deduction will become immediately deductible.

The difference between the immediate tax savings from this deduction and the present value of the tax savings that would have been realized over the next 15 years is the incremental cash inflow relating to these underwriting costs. That figure is shown to be \$89,572 in this case. We see from our calculations, then, that the present value of the tax savings from the amortization of the underwriting costs on the new bonds is \$420,856.

⁴This number was found using Equation 9-1. Mega-Chip's current before-tax cost of debt is 8 percent and its marginal tax rate is 40 percent. Per Equation 9-1, its after-tax cost of debt is:

$$\begin{aligned}
 \text{After-Tax } k_d &= \text{Before-Tax } k_d \times (1 - \text{Tax Rate}) \\
 &= .08 \times (1 - .40) \\
 &= .048, \text{ or } 4.8\%
 \end{aligned}$$

Table 14-3 Mega-Chip Bond Refunding Calculations

Cash Outflows	Calculations	Incremental Cash Flows
Call Premium Paid	$\$50,000,000 \times .05 =$	\$2,500,000
New Bond Underwriting Costs	$\$50,000,000 \times .03 =$	\$1,500,000
Total Outflows		\$4,000,000
Cash Inflows		
Interest Savings	Interest on old bonds: $\$50,000,000 \times .10 = \$5,000,000$ Interest on new bonds: $\$50,000,000 \times .08 = \underline{\$4,000,000}$ \$1,000,000 difference each year for 15 years Less taxes on the additional Income at 40%: $\$1,000,000 \times .40 = (\$400,000)$ Net Savings = \$600,000 per year Present value of the net savings for 15 years at 4.8%: $\$600,000 \times \left[\frac{1 - \frac{1}{1.048^{15}}}{.048} \right] = \$600,000 \times 10.5214 =$	\$6,312,840
Tax Savings on Call Premium Paid (the call premium is a tax deductible expense amortized over the life of the bond issue)	$\$50,000,000 \times .05 \times .04 = \$1,000,000$ Amortized over 15 years = $\$1,000,000 / 15 \text{ years} = \$66,666.67 \text{ per year}$ Present value of the savings for 15 years at 4.8%: $\$66,666.67 \times 10.5214 =$	\$ 701,427
Tax Savings from Writing Off Balance of Old Bond Underwriting Costs	Unamortized Amount = $\$50,000,000 \times .02 \times (15/20)^a$ = \$750,000 Immediate Deduction PV of unamortized amount if bond is not called: ^a $(\$750,000 / 15) \times 10.5214 = \$526,070$ Net Tax Savings = $(\$750,000 - 526,070) \times .4 =$	\$ 89,572
Tax Savings from New Bond Underwriting Costs	$(\$50,000,000 \times .03) / 15 = \$100,000 \text{ per Year Write-off}$ Tax Savings = $\$100,000 \times .4 = \$40,000$ PV of Tax Savings = $\$40,000 \times 10.5214 =$	\$ 420,856
Total Inflows		\$7,524,695
Net Present Value = $\$7,524,695 - \$4,000,000 =$		\$3,524,695

Note: There are 5 of the original 20 years' worth of underwriting costs on the old bonds that have been written off. This leaves 15 of the 20 years, which is all written off immediately if the bonds are refunded.

^aThis is the PV of the tax savings you would have received anyhow without the refunding. The difference is the incremental cash flow from the refunding associated with the underwriting costs on the old bonds that have not yet been written off.

Netting out all the incremental cash outflows and inflows gives a net present value figure of \$3,524,695. Because this NPV figure is greater than zero, Mega-Chip will accept the project and proceed with the bond refunding.⁵

Restrictive Covenants

A company that seeks to raise debt capital by issuing new bonds often makes certain promises to would-be investors to convince them to buy the bonds being offered or to make it possible to issue the bonds at a lower interest rate. These promises made by the issuer to the investor, to the benefit of the investor, are **restrictive covenants**. They represent something like a courtship. If the suitor does not give certain assurances about the way the other party will be treated, there is little chance the relationship will blossom.

In a bond issuer–bond investor relationship, these assurances may include limitations on future borrowings, restrictions on dividends, and minimum levels of working capital that must be maintained.

Limitations on Future Borrowings Investors who lend money to a corporation by buying its bonds expect that the corporation will not borrow excessively in the future. A company in too much debt may be unable to pay bond principal and interest payments on time. Bond investors would be worried if, after buying the bonds of a firm with a 20 percent debt to total assets ratio, the company then issued \$100 million of additional bonds, increasing that ratio to over 90 percent. The new debt would make the earlier-issued bonds instantly more risky and would lower their price in the market.

A restrictive covenant in which the corporation promises not to issue a large amount of future debt would protect the company's current bondholders from falling bond ratings and plunging market prices. A bond issue with this restriction in the indenture will have more value than a bond issue without this guarantee. As a result, the bonds could be issued at a lower coupon interest rate than bonds without the restriction in the indenture.

Restrictions on Dividends An indenture may also include restrictions on the payment of common stock dividends if a firm's times interest earned ratio drops below a specified level. This restriction protects the bondholders against the risk of the common stockholders withdrawing value (cash for dividends that may be needed to make future interest payments) from the firm during difficult times. The bondholders are supposed to have priority over common stockholders. A bond issue with this sort of protection for investors can be issued at a lower interest rate than a bond issue without it.

Minimum Levels of Working Capital Current assets can generally be quickly and easily converted to cash to pay bills. Having a good liquidity position protects all creditors, including bondholders. Minimum working capital guarantees in an indenture provide an additional margin of protection for bondholders and, therefore, reduce the interest rate required on such bonds.

⁵This assumes that the management of Mega-Chip Corporation does not expect interest rates to fall further in the months to come. If managers are confident in a forecast for even lower interest rates to come, they may wait, expecting an even greater NPV in the near future.

The Independent Trustee of the Bond Issue

Violations of any of the provisions included in the indenture could constitute a default. Therefore, an independent **trustee** is named in the indenture to oversee the bond issue and to make sure all the provisions spelled out in the indenture are adhered to. The trustee is usually a commercial bank.

Most people think a default is a failure to make a scheduled interest or principal payment on time. Actually, this is only one possible type of default because the promise to pay interest and principal on their due dates is only part of the promise made by the bond issuer in the indenture. Failure to keep any of the substantive promises mentioned in the indenture constitutes a default.

Types of Bonds

Some of the more innovative new financial instruments have been developed in the bond market. Let's now look more closely at the many kinds of bonds, both traditional and new.

Secured Bonds

A secured bond is backed by specific assets pledged by the issuing corporation. In the event of a default, the investors in these secured bonds would have a claim on these assets.

Mortgage Bonds A bond backed by real assets (not financial assets) is known as a **mortgage bond**. When you buy a house and finance the purchase with a mortgage loan, you are pledging your house (a real asset) as collateral for that loan. You are issuing a mortgage bond to the lender. That is what corporations do when they pledge real assets, such as airplanes and railroad cars, as collateral for the bonds issued to purchase those assets.

Different mortgage bonds can be issued that pledge the same real assets as collateral. Different classes of mortgage bonds signal the priority each investor has on the asset. An investor in a **first-mortgage** bond has first claim on the proceeds from the sale of the pledged assets if there is a default. A later lender may be an investor in a **second-mortgage** bond. In the event of default, the holder of the second mortgage receives proceeds from the sale of the pledged assets only after the first-mortgage bond investors have received all payments due to them. Similarly, third-mortgage bonds, fourth-mortgage bonds, and so forth can be issued with correspondingly lower priorities.

Unsecured Bonds (Debentures)

A bond that is not backed by any collateral is called a debenture. A debenture is backed only by the ability and willingness of the issuing corporation to make the promised interest and principal payments as scheduled. If a debenture were to go into default, the bondholders would be unsecured creditors. They would only have a general claim on the issuing company, not a right to the firm's specific assets.

There may be different classes of debentures. Certain issues may have a higher priority for payment than others. If bond issue A has priority for payment over bond

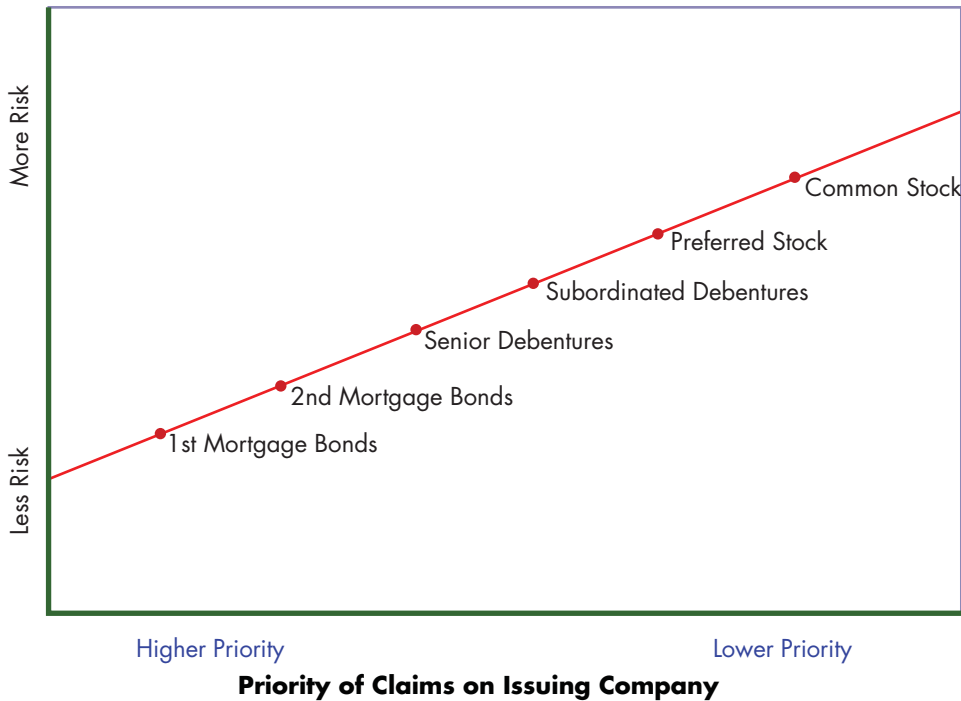


Figure 14-1 The Risk Hierarchy

Figure 14-1 shows the different priorities of claims that creditors and investors have on a company in default. First mortgage bondholders are paid first, whereas common stockholders are paid last.

issue B, according to their respective indentures, then bond issue A is said to be a **senior debenture** and bond issue B is said to be a **subordinated debenture**. A senior debenture has a prior claim to the earnings and liquidation proceeds from the general assets of the firm (those assets not specifically pledged as security for other bonds) relative to the claim of subordinated debenture investors.

Subordinated debentures have a lower-priority claim on the firm's earnings and assets. Because subordinated debentures are riskier than senior debentures, investors demand and issuers pay higher interest rates on them. This higher interest rate is consistent with the risk–return relationship—the greater the risk of a security, the greater the required rate of return. Holders of first-mortgage bonds assume less risk than holders of second-mortgage bonds. Debenture holders have more risk than secured bondholders, and subordinated debenture holders have more risk than senior debenture holders. Preferred stock investors take more risk than a bond investor, and common stock investors take more risk still for a given company. This risk hierarchy, reflecting the relative priority of claims, is shown in Figure 14-1.

Convertible Bonds

One of the special types of bonds available is called a **convertible bond**. A convertible bond is a bond that may be converted, at the option of the bond's owner, into a certain amount of another security issued by the same company. In the vast majority of the cases, the other security is common stock.⁶ This means that the investor who bought the convertible bond may send it back to the issuing company and “convert” it into a certain number of shares of that company's common stock.

⁶Some convertible bonds can be converted into a certain amount of preferred stock or some other security issued by the company.

Table 14-4 Level 3 Communications, Inc., Convertible Bond Characteristics

Maturity Date:	March 15, 2010
Face Value:	\$1,000
Type of Interest:	Semiannual, paid on March 15 and September 15
Coupon Interest Rate:	6%
Conversion Ratio:	7.416

Source: Level 3 Communications SEC Form 10-K filed March 2, 2006

Features of Convertible Bonds Convertible bonds have a face value, coupon rate, interest payment frequency, and maturity spelled out in their indenture, as do regular nonconvertible bonds. The indenture also spells out the terms of conversion, if the investor chooses to exercise that option. If the bond's owner elects not to convert the bond, the owner continues to receive interest and principal payments as with any other bond.

The Conversion Ratio Each convertible bond has a conversion ratio. The **conversion ratio** is the number of shares of common stock that an investor would get if the convertible bond were converted. For example, Level 3 Communications, Inc., issued a convertible \$1,000 bond that matures in 2010, with a conversion ratio of 7.416 (see details in Table 14-4). That means the bond's owner can trade in the bond for 7.416 shares of Level 3 Communications common stock at any time.

The Conversion Value To find the conversion value of a bond, multiply the conversion ratio by the market price per share of the company's common stock, as shown in Equation 14-1:

$$\begin{aligned} & \text{Conversion Value of a Convertible Bond} \\ \text{Conversion Value} &= \text{Conversion Ratio} \times \text{Stock Price} \quad (14-1) \end{aligned}$$

The conversion value is the amount of money bond owners receive if they convert the bond to common stock and then sell the common stock. For example, if Level 3 Communications, Inc., stock were selling for \$5, then the conversion value of the convertible bond described in Table 14-4 would be as follows:

$$\begin{aligned} \text{Conversion Value} &= \text{Conversion Ratio} \times \text{Stock Price} \\ &= 7.416 \times \$5 = \$37.08 \end{aligned}$$

Equation 14-1 shows us that at a rate of \$5 per common stock share, the conversion value of the convertible bond is \$37.08.⁷

The Straight Bond Value If a convertible bond is not converted into stock, then it is worth at least the sum of the present values of its interest and principal payments.⁸ The

⁷This may seem like a ridiculously low conversion value for the bond, but, nonetheless, those are the terms of the bond indenture as recorded in the company's SEC Form 10-K. Not surprisingly, the company says that as of December 31, 2005, none of the bonds had been converted into shares of common stock.

⁸Equation 12-2 in Chapter 12 gives the present value of a bond's interest and principal payments.

value coming from the interest and principal is called the convertible bond's straight bond value. The discount rate used to compute this straight bond value is the required rate of return for a nonconvertible bond having characteristics (risk, maturity, tax treatment, and liquidity) similar to the convertible bond.

As shown in Table 14-4, Level 3 Communications' convertible bond has a coupon interest rate of 6 percent and a maturity date of March 15, 2010. The bond was issued in 2000. With a face value of \$1,000, the annual interest payments will be \$60 (\$1,000 \times .06). Because interest is paid semiannually, actual interest payments of \$30 (\$60 \div 2) are made twice a year. If the required rate of return on similar nonconvertible bonds is 8 percent annual interest (4 percent semiannually),⁹ then according to Equation 12-2, the bond's straight bond value as of March 15, 2006, follows:¹⁰

$$\begin{aligned} V_B &= \$30 \times \left[\frac{1 - \frac{1}{(1 + .04)^8}}{.04} \right] + \frac{\$1,000}{(1 + .04)^8} \\ &= (\$30 \times 6.732744875) + \frac{\$1,000}{1.36856905} \\ &= \$201.9823462 + \$730.6902052 \\ &= \$932.67 \end{aligned}$$

We find that the present value of the interest and principal payments on a four-year, semiannual convertible bond with a face value of \$1,000 and a 6 percent annual coupon interest rate is \$932.67.

A rational investor may convert a bond if it is advantageous but will not convert it if it is disadvantageous. A convertible bond, then, is always worth the conversion value or the straight bond value, whichever is greater.

Variable-Rate Bonds

Although most corporate bonds pay a fixed rate of interest (the coupon interest rate is constant), some pay a variable rate. With a **variable-rate bond**, the initial coupon rate is adjusted according to an established timetable and a market rate index.

The variable bond rates could be tied to any rate, such as a Treasury bond rate or the London Interbank Offer Rate (LIBOR). Bond issuers check this market rate on every adjustment date specified in the indenture and reset the coupon rate accordingly.

The variable rate protects investors from much of the interest rate risk inherent in fixed-rate bonds. Rising inflation hurts investors in fixed-rate bonds because the price of fixed-rate bonds falls as rising inflation increases an investor's required rate of return. In times of rising inflation, the price of a variable-rate bond does not fall as much because the investor knows that a coupon rate adjustment will occur to adjust to new, higher interest rates. However, investors who buy bonds with fixed coupon interest rates will be better off when market interest rates are falling. A variable-rate bond would have its coupon rate drop as market interest rates fell.

Take Note

A convertible bond does not have to be converted to reap the benefits of a high conversion value. The mere fact that the bond could be converted into common stock having a certain value makes the convertible bond worth at least that conversion value.

⁹Actually, if 8 percent were the annual required market rate of return, then the corresponding semiannual required rate of return would be 3.923 percent (1.039232 - 1 = .08 or 8 percent) and not 4 percent. We will round this to 4 percent to simplify the calculation.

¹⁰The number used for n in the equation is 8 because 8 semiannual periods remain until the bond matures.

An issuing corporation can benefit from issuing variable-rate bonds if market rates are historically high and a drop in rates is expected. Of course, high rates can rise even further, in which case the issuing company could lose money.

Puttable Bonds

A **puttable bond** is a bond that can be cashed in before maturity at the option of the bond's owner. This is like the callable bond described earlier in the chapter except that the positions of the issuer and the bond's owner with respect to the option have been reversed. Investors may exercise the option to redeem their bonds early when it is in their best interest to do so. Investors usually redeem fixed-rate bonds if interest rates have risen. The existing, lower-interest-rate bond can be redeemed and the proceeds used to buy a new higher-interest-rate bond.

Junk Bonds

Another type of bond that has become popular (and controversial) is the junk bond. Junk bonds, also known as *high-yield bonds*, have a bond rating below investment grade. As shown earlier in this chapter, according to Moody's ratings, a junk bond would have a rating of Ba1 or below; according to Standard & Poor's ratings, it would have a rating of BB+ or below. The name *junk* is perhaps unfairly applied because these bonds are usually not trash; they are simply riskier than bonds having an investment grade. For instance, many bonds used to finance corporate takeovers have below-investment-grade ratings.

Some junk bonds start out with investment-grade ratings but then suffer a downgrade—the issuing company may have fallen on hard financial times or may have gone through a major financial restructuring that increased the risk of the outstanding bonds. Such junk bonds are known as *fallen angels*. One example of a fallen angel is the May 2006 downgrade of General Motors bonds to BB+. Other companies whose bonds have become fallen angels include Ford, Xerox, AT&T, Kodak, Maytag, Enron, Tyco, Lucent, WorldCom, and RJR Nabisco.

International Bonds

An **international bond** is a bond sold in countries other than where the corporate headquarters of the issuing company is located. The bonds may be denominated in the currency of the issuing company's country or in the currency of the country in which the bonds are sold. Foreign corporations issue bonds in the United States, sometimes denominated in their home currencies and sometimes in U.S. dollars. In turn, U.S. corporations frequently issue bonds outside the United States. These bonds may be denominated in U.S. dollars or in some other currency.

Eurobonds are bonds denominated in the currency of the issuing company's home country and sold in another country. For example, if General Motors issued a dollar-denominated bond in Italy it would be called a Eurobond. Similarly, if Ferrari, an Italian company, issued a euro-denominated bond in the United States, the bond would be called a Eurobond. If the Ferrari bond were denominated in dollars instead of euros, it would be referred to as a *Yankee bond*.

Super Long-Term Bonds

IBM, the Disney Corporation, Coca-Cola, and recently Nacional Electricidad SA, the largest power company in Chile, have issued bonds with a maturity of 100 years,

which is a much longer maturity than is typical among corporate bond issuers. Investors who purchase these bonds must have confidence in the future cash flow of these companies.

In this section we have described types of bonds. Next, we examine preferred stock, its characteristics, and those who purchase it.

Preferred Stock

Preferred stock is so called because owners of preferred stock have a priority claim over common stockholders to the earnings and assets of a corporation. That is, preferred stockholders receive their dividends before common stockholders. Preferred stock is not issued by many corporations except in certain industries, such as public utilities.

The preferred stock dividend is usually permanently fixed, so the potential return on investment for a preferred stockholder is not as high as it is for a common stockholder. Common stockholders are entitled to all residual income of the firm (which could be considerable).

Preferred stock is known as a hybrid security. It is a hybrid because it has both debt and equity characteristics. Preferred stock is like debt primarily because preferred stockholders do not have an ownership claim, nor do they have any claim on the residual income of the firm. It is also like equity because it has an infinite maturity and a lower-priority claim against the firm than bondholders have.

Preferred Stock Dividends

Issuers of preferred stock generally promise to pay a fixed dollar amount of dividends to the investor. This promise, however, does not result in bankruptcy if it is broken. Unlike failure to make a scheduled interest or principal payment to bondholders, failure to pay a scheduled dividend to preferred stockholders is not grounds for bankruptcy of the company that issued the preferred stock.

Occasionally, participating preferred stock is issued. This type of preferred stock offers the chance for investors to share the benefits of rising earnings with the common stockholders. This is quite rare, however.

Preferred stock can be either cumulative or noncumulative with respect to its dividends. With cumulative preferred stock, if a dividend is missed, it must be paid at a later date before dividends may resume to common stockholders. Seldom is any interest paid, however, to compensate preferred stockholders for the fact that when dividends are resumed, they are received later than when promised. Noncumulative preferred stock does not make up missed dividends. If the dividends are skipped, they are lost forever to the investors.

Preferred Stock Investors

Corporations can generally exclude 70 percent of the dividend income received on preferred stock issued by another corporation from their taxable income. As a result, corporations are the major investors in preferred stock. The tax exclusion is higher if the investor corporation owns more than 20 percent of the common stock of the other corporation.

Because of the favorable tax treatment corporations receive on this dividend income, they bid up the price on preferred stock, thus lowering the expected rate of return. The lower expected rate of return is the price they pay for receiving the preferential tax

treatment. Individuals cannot exclude any dividend income on their personal tax returns and must pay taxes on all of it, so preferred stock is not often recommended by financial planners as a good investment for individuals.

Convertible Preferred Stock

Occasionally companies issue preferred stock that is convertible into a fixed number of shares of common stock. The convertible preferred stock may be either cumulative or noncumulative, just like “regular” preferred stock. For example, in March 2002, The Williams Companies, Inc., raised approximately \$275 million from an issue of 1,466,667 shares of 9% percent cumulative convertible preferred stock to MEHC Investment, Inc. Each share of the stock was convertible into 10 shares of Williams common stock.¹¹

In some cases, convertible preferred stock may also be exchanged for a certain number of convertible bonds with the identical pre-tax cash flow and common stock conversion terms. This type of stock is called convertible exchangeable preferred stock.

Leasing

Debt is often incurred to acquire an asset. An alternative to borrowing and buying an asset is to lease the asset. A **lease** is an arrangement in which one party that owns an asset contracts with another party to use that asset for a specified period of time, without conveying legal ownership of that asset. The party who owns the asset is known as the **lessor**. The party who uses the asset is the **lessee**. The lessee makes lease payments to the lessor for the right to use the asset for the specified time period.

A lease contract that is long term and noncancelable is very similar to a debt obligation from the perspective of the lessee. Some contracts that look like genuine leases are not, according to federal tax laws. There are different types of lease contracts. These different types have different accounting treatments, which we turn to next.

Genuine Leases versus Fakes

When a business leases an asset, the entire amount of the lease payments made by the lessee to the lessor is tax deductible to the lessee. When bonds are issued, or a bank loan obtained, only the interest portion of the loan payment is tax deductible. This sometimes leads a company to enter into a contract that looks like a lease, to obtain the large tax deductions, but which is not in fact a lease. The IRS is ever vigilant in ferreting out these fake lease contracts and denying the associated deductions.

To illustrate, suppose you needed a new truck for your business. The purchase price of the truck you want is \$40,000. If you buy the truck and depreciate it over five years (ignore the half-year convention), you would have tax-deductible depreciation expense of \$8,000 per year for five years. What if instead of buying the truck for \$40,000, you leased it from the truck dealer for \$40,000 in up-front cash, followed by additional lease payments of \$1 per year for four years and then an option to buy the truck at the end of five years for \$10? The extra \$14 paid, with the exercising of the purchase option, would be a drop in the bucket compared to the tax savings you would realize in year 1 from the \$40,000 tax deduction for the “lease payments.” Because money has time value, a \$40,000 deduction in year 1 is much preferred to deductions of \$8,000 per year for five years.

¹¹Source: Williams company press release (http://www.williams.com/newsmedia/2002/20020307_193.htm)

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The foregoing lease is a sham, a fake. What we have here is an installment purchase, disguised as a lease. In an audit, the IRS would deny the \$40,000 year 1 “lease payment” and reclassify the deduction as a (much lower) depreciation expense. Your business would probably also be hit with interest charges and penalties.

The IRS standards for a genuine lease are as follows:

1. The remaining life of the asset at the end of the lease term must be the greater of 20 percent of the original useful life or one year.
2. The term of the lease must be 30 years or less.
3. The lease payments must provide the lessor with a reasonable rate of return.
4. Renewal options must contain terms consistent with the market value of the asset.
5. Purchase options must be for an amount close to the asset’s fair market value at the time the option is exercised.
6. The property must not be limited-use (custom made for only one firm’s use) property.

You can see immediately that in our truck example, the purchase option specifies a price (\$10) that is much lower than the fair market value of the truck in five years. The IRS would consider this “lease” to be a sham.

Operating and Financial (Capital) Leases

Once a lease passes the tests for being classified as a genuine lease, it must be further classified for accounting purposes as an operating or financial (capital) lease. An **operating lease** has a term substantially shorter than the useful life of the asset and is usually cancelable by the lessee. A **financial (capital) lease** is long term and noncancelable. The lessee uses up most of the economic value of the asset by the end of the lease’s term with a financial lease.

If you went on a business trip and leased a car for the week to make your business calls, this would be an operating lease. This same car will be leased again to many other customers, and in one week you will use up a small fraction of the car’s economic value. Your company, which is paying your travel expenses, would deduct these lease payments as business expenses on the income statement.

If your company signed a 10-year, noncancelable lease on a \$20 million supercomputer, this is likely to be a financial lease (also known as a capital lease). After 10 years the supercomputer is likely to be obsolete. Your company would have used up most, if not all, its economic value by the end of the 10-year lease period. The lessor surely would demand lease payments high enough to recognize this fact and also to compensate for the time value of money that is paid over a 10-year period. The fact that the payments are spread out over time means that the lessor must be compensated for the cost of the asset and for the delay in the receipt of the lease payments.

Accounting Treatment of Leases Both operating and financial (capital) lease payments show up on the income statement. Assuming that a lease is genuine, payments made by the lessee to the lessor are shown on the income statement as tax-deductible business expenses for both types of leases. These are costs of doing business for the lessee.

Financial leases have another accounting impact, however, that operating leases do not. A financial lease also shows up on the company's balance sheet because it is functionally equivalent to buying the asset and financing the purchase with borrowed money. If the asset had been purchased and financed with debt, the asset and the liability associated with the debt would both show up on the balance sheet. Because a financial lease is functionally equivalent to a purchase financed with debt, the Financial Accounting Standards Board (FASB) has ruled that the accounting treatment should be similar.

Failure to make a bond payment can lead to bankruptcy, as can failure to make a contractual lease payment on a noncancelable lease. The leased asset is shown in the asset section of the lessee's balance sheet, with a corresponding liability entry in the amount of the present value of all the lease payments owed to the lessor.

A lease is classified as a financial (capital) lease if it meets *any one* of the following four criteria:

1. Ownership of the asset is transferred to the lessee at the end of the lease's term.
2. There is an option for the lessee to buy the asset at a bargain purchase price at the end of the lease period.
3. The lease period is greater than or equal to 75 percent of the estimated useful life of the asset.
4. The present value of the lease payments equals 90 percent or more of the fair market value of the asset at the time the lease is originated, using the lower of the lessee's cost of debt or the lessor's rate of return on the lease as the discount rate.

Only if none of these four criteria applies is the lease considered an operating lease, with no balance sheet entry.

Lease or Buy?

Leasing is growing in popularity. Whether an asset should be leased or bought depends on the relative costs of the two alternatives. Leasing is most nearly comparable to a buy-borrow alternative. Because signing a debt contract is similar to signing a lease contract, comparisons are usually made between the lease option and the buy with borrowed funds option.

The alternative that has the lower present value of after-tax costs is usually chosen. The tax factor considered for the lease alternative would be the tax deductibility of the lease payments that would be made (assuming the lease is genuine and passes IRS muster). The tax factors for the buy with borrowed funds alternative would come primarily from two sources. One is the tax deduction that comes with the payment of interest on the borrowed funds. The other is the tax deduction that comes with the depreciation expense on the purchased asset.

A Lease or Buy Decision Example Let's go through an example of a lease or buy decision to illustrate the computations involved. For our example, we will use Mr. Sulu in the Photon Manufacturing Company, whose project was described in Chapter 11. Recall that Mr. Sulu was considering a project to install \$3 million worth of new machine

tools in the company's main torpedo manufacturing plant. According to the analysis in Chapter 11, the NPV of the project was positive, so Mr. Sulu decided to obtain the new machine tools. Now the decision about how to finance the acquisition must be made. For simplicity, let us assume that two alternatives are available: (1) The machine tools can be purchased using the proceeds from a \$3 million, five-year, 10 percent interest rate loan from a bank, or (2) the machine tools can be leased for \$500,000 a year, payable at the beginning of each of the next five years. At the end of the lease term, the tools would be returned to the lessor for disposal.¹² If the tools are purchased, they can be sold for salvage at the end of five years for \$800,000.

The decision to lease or to borrow and purchase the machine tools can be made by comparing the present value of the cash flows associated with each alternative. Table 14-5 contains the analysis for Mr. Sulu's new machine tools. Notice in Table 14-5 that the analysis is conducted from the point of view of Photon Manufacturing's stockholders, so it is the incremental cash flows to equity that are relevant.

In the top portion of Table 14-5, the analysis of the buy option is presented, in which the asset is purchased with borrowed funds. The analysis begins with the \$3,000,000 cash outflow for the purchase of the tools, which is offset by a \$3,000,000 cash inflow from the proceeds from the loan, making the net cash flow at t_0 zero dollars. Next, the cash flows at the end of years 1 through 5 are considered. Depreciation expense will be recorded at the end of years 1 through 4, because the tools fall into the MACRS three-year asset class. The depreciation expense is tax-deductible, so at the end of years 1 through 4 the firm will experience tax savings equal to the depreciation expense times the firm's income tax rate of 40 percent. Depreciation is a noncash expense, but the income tax savings represent real cash inflows to the firm at the end of years 1 through 4.

Interest payments on the loan in the amount of \$3,000,000 times 10 percent must be made at the end of years 1 through 5. Also at the end of year 5, the \$3,000,000 must be repaid. Finally, when the tools are sold for salvage at the end of the fifth year, their book value is zero, so income tax must be paid on the \$800,000. The amount to be paid is $\$800,000 \times 40 \text{ percent} = \$320,000$.

When all the cash flows are added up, the net incremental cash flows are \$219,600 in year 1, \$354,000 in year 2, negative \$2,400 in year 3, negative \$91,200 in year 4, and negative \$2,700,000 in year 5, as shown in Table 14-5. To calculate the present value of the cash flows, they are discounted at the after-tax cost of borrowing the \$3,000,000, which in this case is $10\% \times (1 - .40) = 6\%$. The results indicate that the total present value of the cash flows associated with buying the machine tools is negative \$1,569,623.

In the bottom portion of Table 14-5, the analysis of the lease option is presented. In this case the only relevant cash flows are the lease payments and the associated tax savings that occur because the lease payments are tax-deductible. The tax savings are calculated by multiplying the lease payment (\$500,000) by the firm's tax rate (40 percent). Note that the five annual lease payments are made at the beginning of each year. Adding the tax savings and the lease payment produces the net incremental cash flow associated with leasing each year, which is \$300,000. Because the cash flows associated with leasing are almost certain, like the firm's debt cash flows, the lease cash flows are discounted at the after-tax cost of debt (6 percent) to calculate their present values. Their total present value, as shown in Table 14-5, is negative \$1,263,709.

¹²For simplicity in this example, we will assume that the lease is a straightforward operating lease, so no other accounting considerations are required.

Table 14-5 Photon Manufacturing Company Lease–Buy Analysis**PART 1, THE BUY OPTION****Assumptions**

Cost of New Tools	\$3,000,000
Expected Life	5 years
Salvage Value	\$ 800,000
Amount to Be Borrowed	\$3,000,000
Interest Rate on Loan	10%

MACRS Depreciation

	Yr 1	Yr 2	Yr 3	Yr 4
(3-Year Asset Class)	33.3%	44.5%	14.8%	7.4%
Discount Rate	6% (after-tax cost of debt)			
Tax Rate	40%			

Estimated Incremental Cash Flows to Equity

Year	0	1	2	3	4	5
Cost of New Tools	\$(3,000,000)					
Amount to Be Borrowed	3,000,000					
Depreciation on New Tools		\$(999,000)	\$(1,335,000)	\$(444,000)	\$(222,000)	\$0
Tax Savings on Depreciation		399,500	534,000	177,600	88,800	0
Interest Payments on Loan		\$(300,000)	(300,000)	(300,000)	(300,000)	(300,000)
Tax Savings on Interest		120,000	120,000	120,000	120,000	120,000
Repayment of Principal on Loan						(3,000,000)
Salvage Value of New Tools						800,000
Tax on Gain						(320,000)
Net Incremental Cash Flows	\$ 0	\$ 219,600	\$ 354,000	\$(2,400)	\$(91,200)	\$(2,700,000)
PV of Cash Flows	\$ 0	\$(207,170)	\$ 315,059	\$(2,015)	\$(72,239)	\$(2,017,597)

Total PV of Cash Flows Associated with the Buy Option**\$(1,569,623)****Cost of Buying with Borrowed Funds****\$(1,569,623)****PART 2, THE LEASE OPTION****Assumptions**

Annual Lease Payment	\$(500,000) paid at the beginning of each year
Lease Term	5 years
Value at Termination of Lease	\$0

Estimated Incremental Cash Flows to Equity

Year	0	1	2	3	4	5
Lease Payment	\$(500,000)	\$(500,000)	\$(500,000)	\$(500,000)	\$(500,000)	
Tax Savings on Lease Payment		\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	
Net Incremental Cash Flows	\$(300,000)	\$(300,000)	\$(300,000)	\$(300,000)	\$(300,000)	
PV of Cash Flows	\$(283,019)	\$(266,999)	\$(251,886)	\$(237,628)	\$(224,177)	

Total PV of Cash Flows Associated with the Lease Option**\$(1,263,709)****Cost of Leasing****\$ 1,263,709****Net Advantage to Leasing (NAL) = Total Cost of Buying with Borrowed Funds - Cost of Leasing****\$ 305,914)**

To decide whether to lease or buy the new machine tools, Mr. Sulu compares the present value of the cash flows associated with buying with the present value of the cash flows associated with leasing:

Cost of Buying with Borrowed Funds	\$1,569,623
Cost of Leasing	\$1,263,709
Net Advantage to Leasing (NAL)	\$ 305,914

Observing that the cost of leasing is \$305,914 less than the cost of buying with borrowed funds, Mr. Sulu directs his staff to proceed with the leasing arrangements.

Companies that are likely to see a clear advantage to leasing instead of buying are those that are losing money. Such companies, because they have negative taxable income, pay no taxes. The deductions for interest and depreciation expenses could not be used (subject to carry back and carry forward provisions of losses to earlier or later years). If the asset is leased instead from a profitable lessor, the lessor can take advantage of the interest and depreciation expense tax deductions and the lessee can negotiate a lease payment that is lower than it otherwise would be, so that these tax benefits are shared by the lessor and the lessee.

Many airlines are losing money. The next time you take a plane trip, look for a small sign just inside the passenger entrance of the plane. It may say that the airplane you are about to travel on is owned by a leasing company (the lessor) and leased by the airline (the lessee).

What's Next

In this chapter we learned about the basic characteristics of bonds and the different types of bonds available. We also examined preferred stock and leasing. In Chapter 15 we will discuss common stock, how it is issued, and the nature of the equity claim of the common stockholders.

Summary

1. Describe the contract terms of a bond issue.

The indenture is the contract that spells out the terms of the bond issue. A call provision gives the issuer the option to buy back the bonds before the scheduled maturity date. A conversion provision gives the bondholder the option to exchange the bond for a given number of shares of stock. Restrictive covenants may include limits on future borrowings by the issuer, minimum working capital levels that must be maintained, and restrictions on dividends paid to common stockholders.

2. Distinguish the various types of bonds and describe their major characteristics.

All bonds are debt instruments that give the holder a liability claim on the issuer. A mortgage is a bond secured by real property. A debenture is an unsecured bond. A convertible bond is convertible, at the option of the bondholder, into a certain number of shares of common stock (sometimes preferred stock or another security).

A variable-rate bond has a coupon interest rate that is not fixed but is tied to a market interest rate indicator. A puttable bond can be cashed in by the bondholder before

maturity. Bonds that are below investment grade are junk bonds. An international bond, a bond sold in a country other than the country of the corporate headquarters of the issuing company, differs from a Eurobond. A Eurobond is a bond denominated in the currency of the issuing company's home country and sold in another country. A super long-term bond is one that matures in 100 years.

3. Describe the key features of preferred stock.

Preferred stock is a hybrid security that has debt and equity characteristics. Preferred stockholders have a superior claim relative to the common stockholders to a firm's earnings and assets, and their dividend payments are usually fixed. Those traits resemble debt. In addition, preferred stock has an infinite maturity and lower-priority claim to assets and earnings than bondholders. Because of the corporate tax exclusion of some preferred stock dividends from taxable income, corporations are much more likely to invest in stock than individuals.

4. Compare and contrast a genuine lease and a disguised purchase contract.

Because lease payments are entirely tax deductible, many attempt to disguise purchase contracts as genuine leases. A lease is an arrangement in which the owner of an asset contracts to allow another party the use of the asset over time. In order for the lease to be genuine, the lessee (the party to whom the asset is leased) must not have an effective ownership of the asset. The IRS has six standards that a lease must meet to qualify for the lease tax deductions. Failure to comply with IRS rules will result in the less favorable tax treatment of a purchase contract.

5. Explain why some leases must be shown on the balance sheet.

Operating leases are usually short term and cancelable. Financial (capital) leases are long term and noncancelable. Both operating and financial leases appear on the income statement of the lessee because they are tax-deductible business expenses. Because financial leases are functionally equivalent to a purchase financed with debt, FASB rules require that businesses treat them similarly for accounting purposes. Financial leases, therefore, appear on the balance sheet.

Equations Introduced in This Chapter

Equation 14-1. Conversion Value of a Convertible Bond:

$$\text{Conversion Value} = \text{Conversion Ratio} \times \text{Stock Price}$$

Self-Test

ST-1. Explain the features of a bond indenture.

ST-2. What is a callable bond?

ST-3. What is the straight bond value of a convertible bond?

ST-4. What is cumulative preferred stock?

ST-5. Which financial statement(s) would a financial lease affect? Why?

ST-6. What is the conversion value of a convertible bond having a current stock price of \$15 and a conversion ratio of 20?

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Review Questions

1. How does a mortgage bond compare with a debenture?
2. How does a sinking fund function in the retirement of an outstanding bond issue?
3. What are some examples of restrictive covenants that might be specified in a bond's indenture?
4. Define the following terms that relate to a convertible bond: conversion ratio, conversion value, and straight bond value.
5. If a convertible bond has a conversion ratio of 20, a face value of \$1,000, a coupon rate of 8 percent, and the market price for the company's stock is \$15 per share, what is the convertible bond's conversion value?
6. What is a callable bond? What is a puttable bond? How do each of these features affect their respective market interest rates?

Build Your Communication Skills

- CS-1.** Select a corporate bond and research its indenture provisions. What must the issuer do and what must the issuer not do? Write a brief report of one to two pages on your findings.
- CS-2.** Does a bond issuer owe potential investors full disclosure of plans that might affect the value of the bonds, or is the issuer's duty to investors only what is explicitly stated in the indenture contract? Divide into small groups to debate this issue.

Problems

- 14-1.** Sean Thornton has invested in a convertible bond issued by Cohan Enterprises. The conversion ratio is 20. The market price of Cohan common stock is \$60 per share. The face value is \$1,000. The coupon rate is 8 percent and the annual interest is paid until the maturity date 10 years from now. Similar nonconvertible bonds are yielding 12 percent (YTM) in the marketplace. Calculate the straight bond value of this bond.  **Straight Bond Value**
- 14-2.** Use the same data given in problem 14-1. Now assume that interest is paid semiannually (\$40 every six months). Calculate the straight bond value.  **Straight Bond Value**
- 14-3.** Using the data in problem 14-1, calculate the conversion value of the Cohan Enterprises convertible bond.  **Conversion Value**
- 14-4.** Jenessa Wilkens purchased 10 convertible bonds from Raingers in 2006 that mature in 2016 with a conversion ratio of 26.5 each. Currently Raingers stock is selling for \$32 per share. Jenessa wants to convert six of her bonds. What is the conversion value of these six bonds?  **Conversion Value**

Straight Bond Value 

14-5. Amear Kyle has a balance in his savings account of \$10,000. He wants to invest 10 percent of this amount into a convertible bond issued by the Hampton Corp. The market price of Hampton Corp. common stock is \$85 per share. The convertible bond has a conversion ratio of 30. This bond has a 9 percent annual coupon rate (paid quarterly), a maturity of 15 years, and a face value of \$1,000. Nonconvertible bonds with similar attributes are yielding 15 percent. Calculate the straight bond value for this bond.

Conversion Value 

14-6. Using the values in 14-5, find the conversion value of this bond.

Straight Bond Value 

14-7. Characteristics of Tanbs, Inc., convertible bonds.

Conversion Ratio	25.885
Face Value	\$1,000
Maturity Date	15 years hence
Coupon Interest Rate	6.75% annual
Interest Paid	semiannually

Calculate Tanbs, Inc.'s straight bond value on its convertible bonds. The current market interest rate on similar nonconvertible bonds is 8 percent.

Sinking Fund 

14-8. Two years ago a company issued \$10 million in bonds with a face value of \$1,000 and a maturity of 10 years. The company is supposed to put aside \$1 million in a sinking fund each year to pay off the bonds. Dolly Frisco, the finance manager of the company, has found out that the bonds are selling at \$800 apiece in the open market now when a deposit to the sinking fund is due. How much would Dolly save (before transaction costs) by purchasing 1,000 of these bonds in the open market instead of calling them in at \$1,000 each?

Call Provision 

14-9. Five years ago BLK issued bonds with a 7 percent coupon interest rate. The bond's indenture stated that the bonds were callable after three years. So, four years later interest rates fell to 5 percent, the company called the old bonds and refunded at the 5 percent rate. If BLK issued 30,000 10-year bonds, how much did BLK save in interest per year?

Call Provision 

14-10. A company where J. B. Brooks works as the vice president of finance issued 20,000 bonds 10 years ago. The bonds had a face value of \$1,000, annual coupon rate of 10 percent, and a maturity of 20 years. This year the market yield on the company's bond is 8 percent. The bonds are callable after five years at par. If Ms. Brooks decides in favor of exercising the call option, financing it through a refunding operation, what would be the annual savings in interest payments for the company? (Interest is paid annually.)

Call Premium 

14-11. Use the same information given in problem 14-10. Now assume that the call premium is 5 percent and the bonds were called back today. J. B. Brooks purchased 10 bonds when they were originally issued at \$950 per bond. Calculate the realized rate of return for Brooks.

- 14-12.** J. B. Brooks of problem 14-11, after getting her bonds called back by the original issuing company, can now invest in a \$1,000 par, 8 percent annual coupon rate, 10-year maturity bond of equivalent risk selling at \$950. (Interest is paid annually.)
- What is the overall return for Brooks over the 20 years, assuming the bond is held until maturity?
 - Compare the overall return with the return on the bonds in problem 14-8 if they had not been called. Did Brooks welcome the recall?
- 14-13.** Captain Nathan Brittles invested in a \$1,000 par, 20-year maturity, 9 percent annual coupon rate convertible bond with a conversion ratio of 20 issued by a company six years ago. What is the conversion value of Captain Brittles's investment if the current market price for the company's common stock is \$70 per share? (Interest is paid annually.)
- 14-14.** Use the same information given in problem 14-13. If the current required rate of return on a similar nonconvertible bond is 7 percent, what is the straight bond value for the bond? Should Captain Brittles convert the bond into common stock now?
- 14-15.** Tom Dunston invested in a \$1,000 par, 10-year maturity, 11 percent coupon rate convertible bond with a conversion ratio of 30 issued by a company five years ago. The current market price for the company's common stock is \$30 per share. The current required rate of return on similar but nonconvertible bonds is 13 percent. Should Mr. Dunston consider converting the bond into common stock now?
- 14-16.** Six years ago Ruby Carter invested \$1,000 in a \$1,000 par, 20-year maturity, 9 percent annual coupon rate putable bond, which can be redeemed at \$900 after five years. If the current required rate of return on similar bonds is 13 percent, should Ruby redeem the bond? What is the realized rate of return after redeeming? (Interest is paid annually.)
- 14-17.** Five years ago Diana Troy invested \$1,000 in a \$1,000 par, 10-year maturity, 9 percent annual coupon rate putable bond, which can be redeemed at \$900 after five years. If the current required rate of return on similar bonds is 14 percent, should Diana redeem the bond? What is the realized rate of return after redeeming? If Diana reinvests the sum in a \$1,000 par, five years to maturity, 13 percent annual coupon rate bond selling at \$900 and holds it until maturity, what is her realized rate of return over the next five years? What is her realized rate of return over the entire 10 years?
- 14-18.** Hot Box Insulators, a public company, initially issued investment-grade, 20-year maturity, 8 percent annual coupon rate bonds 10 years ago at \$1,000 par. A group of investors bought all of Hot Box's common stock through a leveraged buyout, which turned the bonds overnight into junk bonds. Similar junk bonds are currently yielding 25 percent in the market. Calculate the current price of the original bonds.

 **Total Return on Investment**

 **Conversion Value**

 **Straight Bond Value**

 **Bond Conversion**

 **Putable Bond**

 **Reinvesting Putable Bond**

 **Challenge Problem**

Priority of Claim 

14-19. Profit Unlimited Company is in bankruptcy. The company has the following liability and equity claims:

First-Mortgage Bonds	\$5 million
Second-Mortgage Bonds	5 million
Senior Debentures	10 million
Subordinated Debentures	4 million
Common Stock	10 million (par value)

Mortgaged assets have been sold for \$7 million and other assets for \$13 million. According to priority of claims, determine the distribution of \$20 million obtained from the sale proceeds.

Bond Refunding 

14-20. Suppose the Builders-R-Us Real Estate Finance Corporation has \$60 million worth of bonds outstanding with an annual coupon interest rate of 8 percent. However, market interest rates have fallen to 6 percent since the bonds were issued 10 years ago. Accordingly, Builders-R-Us would like to replace the old 8 percent bonds with a new issue of 6 percent bonds.

The relevant financial data are summarized here:

Old Bond Issue	\$60,000,000, 8% annual interest rate, interest paid semiannually, 20 years original maturity, 10 years remaining to maturity
Call Premium on Old Bond	4%
Underwriting Costs on Old Bonds When Issued 5 Years Ago	2% of amount issued
New Bond Issue	\$60,000,000, 6% annual interest rate, interest paid semiannually, 10 years to maturity
Underwriting Costs on New Bonds	3% of amount issued
Marginal Tax Rate	40%
Discount Rate for Present Value Analysis (After-Tax Cost of Debt)	3.6%

The Builders-R-Us Corporation will be issuing new bonds having the same maturity as the number of years remaining to maturity on the old bonds.

- What are the total cash outflows that Builders-R-Us will incur at time zero if the company implements the proposed bond refunding program?
- What is the annual before-tax savings in interest payments that Builders-R-Us would realize?
- What is the annual after-tax savings in interest payments that Builders-R-Us would realize?
- What is the present value of the annual after-tax interest savings?
- What are the annual tax savings on the call premium that will be paid in the refunding program?
- What is the present value of the annual tax savings on the call premium?
- What are the net tax savings from writing off the balance of the old bond underwriting costs?
- What are the tax savings from the new bond underwriting costs?
- What is the present value of the tax savings from the new bond underwriting costs?

- j. What is the present value of the total cash inflows that will occur if the bond refunding program is implemented?
- k. What is the net present value of the proposed bond refunding program? Would you advise Builders-R-Us to proceed with the program?

- 14-21.** Regina Hitechia, the CIO of Aurora Glass Fibers, Inc., is considering whether to lease or buy some new computers in the company's manufacturing plant. The new computers can be purchased for \$800,000 with the proceeds from a 4-year, 10 percent interest rate loan, or leased for \$250,000 a year, payable at the beginning of each year for the next four years. The computers fall into MACRS depreciation three-year asset class and have an expected useful life of four years. The salvage value of the computers at the end of the fourth year is \$100,000. If the computers are leased, they will be returned to the leasing company at the end of the fourth year. Aurora's marginal tax rate is 40 percent.
- a. What is the present value of the cash flows associated with buying the computers?
 - b. What is the present value of the cash flows associated with leasing the computers?
 - c. Should Ms. Hitechia purchase or lease the new computers?

 **Lease-Buy Analysis**



Answers to Self-Test

- ST-1.** A bond indenture is the contract that spells out the provisions of a bond issue. It always contains the face value, coupon rate, interest payment dates, and maturity date. It may also include terms of security in the case of default, if any; the plan for paying off the bonds at maturity; provisions for paying off the bonds ahead of time; restrictive covenants to protect bondholders; and the trustee's name.
- ST-2.** A callable bond is a bond that can be paid off early by the issuer at the issuer's option.
- ST-3.** The straight bond value of a convertible bond is the value a convertible bond would have without its conversion feature. It is the present value of the interest and principal using the required rate of return on a similar nonconvertible bond as the discount rate.
- ST-4.** Cumulative preferred stock is preferred stock for which missed dividends must be made up (paid) by the issuing company before common stock dividends may be resumed.
- ST-5.** A financial (capital) lease would show up on both the income statement and the balance sheet. Lease payments are business expenses that belong on the income statement, and FASB rules call for financial leases to be reflected on the balance sheet also.
- ST-6.** \$15 market price of the stock \times 20 conversion ratio = \$300 conversion value of the convertible bond.

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