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CHAPTER | SIXTEEN

Long-Term Debt and Lease Financing

16

CHAPTER | CONCEPTS

1 Analyzing long-term debt requires consideration of the collateral pledged, method of repayment, and other key factors.

2 Bond yields and prices are influenced by how bonds are rated by major bond rating agencies.

3 An important corporate decision is whether to call in and reissue debt (refund the obligation) when interest rates decline.

4 Innovative bond forms are represented by zero-coupon rate bonds and floating rate bonds.

5 Long-term lease obligations have many characteristics similar to debt and are recognized as a form of indirect debt by the accounting profession.

The telecommunications industry proved to be a treacherous place for bond investors in the early 2000s. In 2002, the bonds of WorldCom were down 53.3 percent; those of Telequest, 47.6 percent; Adelphia, 26.6 percent; and Qwest, 24.4 percent. All were major players in the telecom (telephones, cell phones, etc.) industry.

Part of the reason for the decline was concern about future growth prospects. When the economy took a nosedive in 200l–2002, these bonds did too. Many of the telecom companies represented "fallen angels," meaning they went from investment grade status to junk bonds (bonds that do not fall into the first four bond rating categories of AAA to BBB). Others even faced bankruptcy.

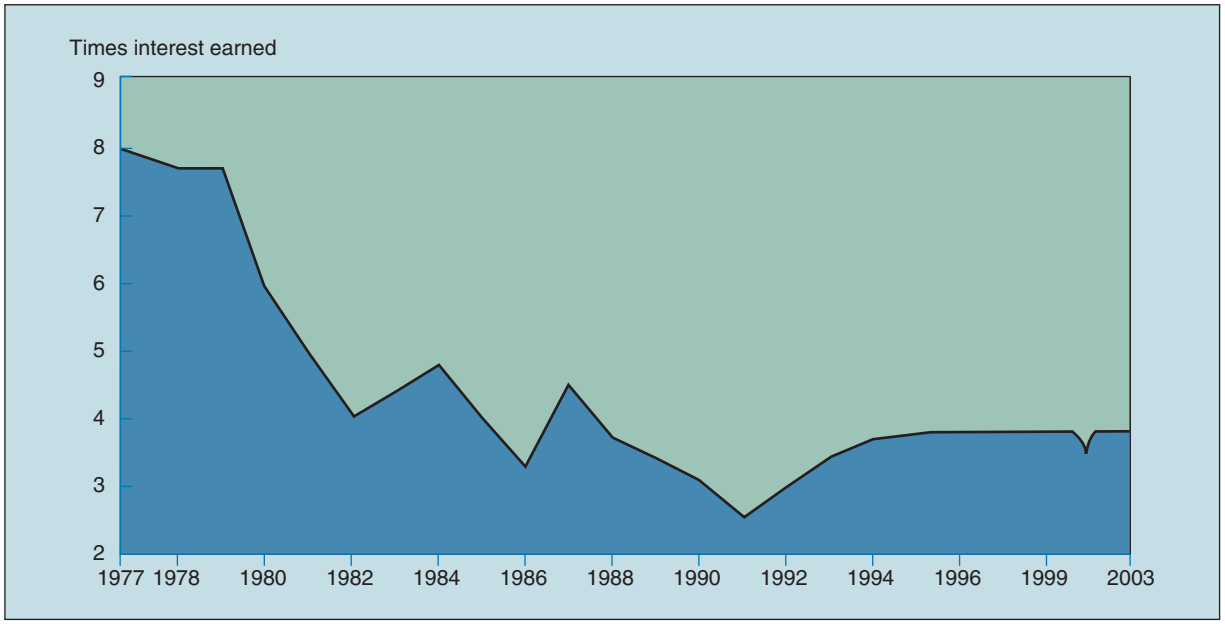
The *stocks* of the telecom companies fared even worse. Telecom equity investors lost $2 trillion, which was twice the size of the Internet stock losses and on par with savings and loan losses during their crisis of the late 1980s.

Many feel the marquee telecoms will eventually recover once excess capacity is eliminated and the demand for the industry's products picks up. It is even possible that some fallen angel bonds will return to their former investment grade status.

The Expanding Role of Debt

Corporate debt has increased dramatically in the last three decades. This growth is related to rapid business expansion, the inflationary impact on the economy, and, at times, inadequate funds generated from the internal operations of business firms. The expansion of the U.S. economy has placed pressure on U.S. corporations to raise capital and will continue to do so. In this context a new set of rules has been developed for evaluating corporate bond issues. Some deterioration in borrowing qualifications has occurred. In 1977 the average U.S. manufacturing corporation had its interest payments covered by operating earnings at a rate of eight times (operating earnings were eight times as great as interest). By the year 2003, the ratio had been cut to less than half that amount. Figure 16–1 indicates the long-term trend is down, but it is also cyclically dependent on the economy. The recession of 1990–1991 pushed times interest earned to its lowest level over the time period, but it recovered in the subsequent economic expansion. With the declining interest-paying capabilities of some U.S. corporations, the debt contract between corporate borrowers and lenders has become increasingly important.

Figure 16–1
Times interest earned for Standard & Poor's industrials



The Debt Contract

The corporate bond represents the basic long-term debt instrument for most large U.S. corporations. The bond agreement specifies such basic items as the par value, the coupon rate, and the maturity date.

Par Value This is the initial value of the bond. The **par value** is sometimes referred to as the principal or face value. Most corporate bonds are initially traded in $1,000 units.

Coupon Rate This is the actual interest rate on the bond, usually payable in semi-annual installments. To the extent that interest rates in the market go above or below the coupon rate after the bond has been issued, the market price of the bond will change from the par value.

Maturity Date The **maturity date** is the final date on which repayment of the bond principal is due.

The bond agreement is supplemented by a much longer document termed a bond **indenture.** The indenture, often containing over 100 pages of complicated legal wording, covers every detail surrounding the bond issue—including collateral pledged, methods of repayment, restrictions on the corporation, and procedures for initiating claims against the corporation. The corporation appoints a financially independent trustee to administer the provisions of the bond indenture under the guidelines of the Trust Indenture Act of 1939. Let's examine two items of interest in any bond agreement: the security provisions of the bond and the methods of repayment.

Security Provisions

A **secured debt** is one in which specific assets are pledged to bondholders in the event of default. Only infrequently are pledged assets actually sold and the proceeds distributed to bondholders. Typically the defaulting corporation is reorganized and existing claims are partially satisfied by issuing new securities to the participating parties. The stronger and better secured the initial claim, the higher the quality of the new security to be received in exchange. When a defaulting corporation is reorganized for failure to meet obligations, existing management may be terminated and, in extreme cases, held legally responsible for any imprudent actions.

A number of terms are used to denote collateralized or secured debt. Under a **mortgage agreement,** real property (plant and equipment) is pledged as security for the loan. A mortgage may be senior or junior in nature, with the former requiring satisfaction of claims before payment is given to the latter. Bondholders may also attach an **after-acquired property clause,** requiring that any new property be placed under the original mortgage.

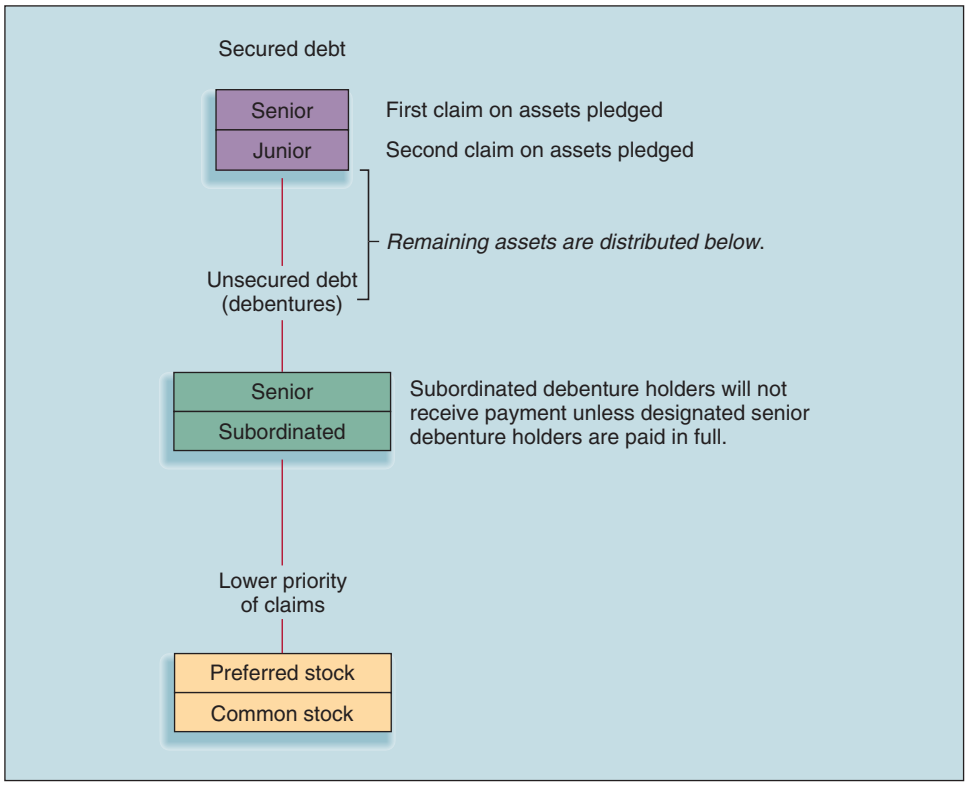
The student should realize not all secured debt will carry every protective feature, but rather represents a carefully negotiated position including some safeguards and rejecting others. Generally, the greater the protection offered a given class of bondholders, the lower is the interest rate on the bond. Bondholders are willing to assume some degree of risk to receive a higher yield.

Unsecured Debt

A number of corporations issue debt that is not secured by a specific claim to assets. In Wall Street jargon, the name **debenture** refers to a long-term, unsecured corporate bond. Among the major participants in debenture offerings are such prestigious firms as ExxonMobil, IBM, Dow Chemical, and Intel. Because of the legal problems associated with "specific" asset claims in a secured bond offering, the trend is to issue unsecured debt—allowing the bondholder a general claim against the corporation—rather than a specific lien against an asset.

Even unsecured debt may be divided between high-ranking and subordinated debt. A **subordinated debenture** is an unsecured bond in which payment to the holder will occur only after designated senior debenture holders are satisfied. The hierarchy of creditor obligations for secured as well as unsecured debt is presented in Figure 16–2, along with consideration of the position of stockholders. For a further discussion of payment of claims and the hierarchy of obligations, the reader should see Appendix 16A, "Financial Alternatives for Distressed Firms," which also covers bankruptcy considerations.

Figure 16–2
Priority of claims



Methods of Repayment

The method of repayment for bond issues may not always call for one lump-sum disbursement at the maturity date. Some Canadian and British government bonds are perpetual in nature. More interestingly, West Shore Railroad 4 percent bonds are not scheduled to mature until 2361 (approximately 360 years in the future). Nevertheless most bonds have some orderly or preplanned system of repayment. In addition to the simplest arrangement—a single-sum payment at maturity—bonds may be retired by serial payments, through sinking-fund provisions, through conversion, or by a call feature.

Serial Payments Bonds with **serial payment** provisions are paid off in installments over the life of the issue. Each bond has its own predetermined date of maturity and receives interest only to that point. Although the total issue may span over 20 years, 15 or 20 different maturity dates may be assigned specific dollar amounts.

Sinking-Fund Provision A less structured but more popular method of debt retirement is through the use of a **sinking fund.** Under this arrangement semiannual or annual contributions are made by the corporation into a fund administered by a trustee for purposes of debt retirement. The trustee takes the proceeds and purchases bonds from willing sellers. If no willing sellers are available, a lottery system may be used among outstanding bondholders.

Conversion A more subtle method of reducing debt outstanding is to provide for debt conversion into common stock. Although this feature is exercised at the option of the bondholder, a number of incentives or penalties may be utilized to encourage conversion. The mechanics of convertible bond trading are discussed at length in Chapter 19, "Convertibles, Warrants, and Derivatives."

Call Feature A **call provision** allows the corporation to retire or force in the debt issue before maturity. The corporation will pay a premium over par value of 5 to 10 percent—a bargain value to the corporation if bond prices are up. Modern call provisions usually do not take effect until the bond has been outstanding at least 5 to 10 years. Often the call provision declines over time, usually by 0.5 to 1 percent per year after the call period begins. A corporation may decide to call in outstanding debt issues when interest rates on new securities are considerably lower than those on previously issued debt (let's get the high-cost, old debt off the books).

An Example: Dillard's 7.875 Percent Bond

Now that we have covered the key features of the bond indenture, let us examine an existing bond. Table 16–1 presents an excerpt from *Mergent Bond Record* (formerly *Moody's Bond Record)* for March 2003, and we find that Dillard Department Stores, one of the largest retailers in the world, has a 7.875 debenture due in 2023. As of March 2003, the bond carried a Moody's rating of Ba3. More specific features of this bond are found in Table 16–2, which is an excerpt from *Mergent's Industrial Manual.*

As we can see in Table 16–2, the 7.875 percent bond had an original authorized offering of $100 million. The trustee is Chase Manhattan Bank, and it is the trustee's obligation to make sure Dillard's adheres to the indenture.

The information in Table 16–2 also provides other pertinent information found in the indenture, such as the interest payment dates (January 1 and July 1), denominations of each bond, security provisions, call features, and high and low bond prices.

Bond Prices, Yields, and Ratings

The financial manager must be sensitive to interest rate changes and price movements in the bond market. The treasurer's interpretation of market conditions will influence the timing of new issues, the coupon rate offered, and the maturity date. Lest the student of finance think bonds maintain stable long-term price patterns, he or she need merely consider bond pricing during the five-year period 1967–72. When the market interest rate on outstanding 30-year, Aaa corporate bonds went from 5.10 percent to 8.10 percent, the average price of existing bonds dropped 36 percent. A conservative investor would be quite disillusioned to see a $1,000, 5.10 percent bond now quoted at

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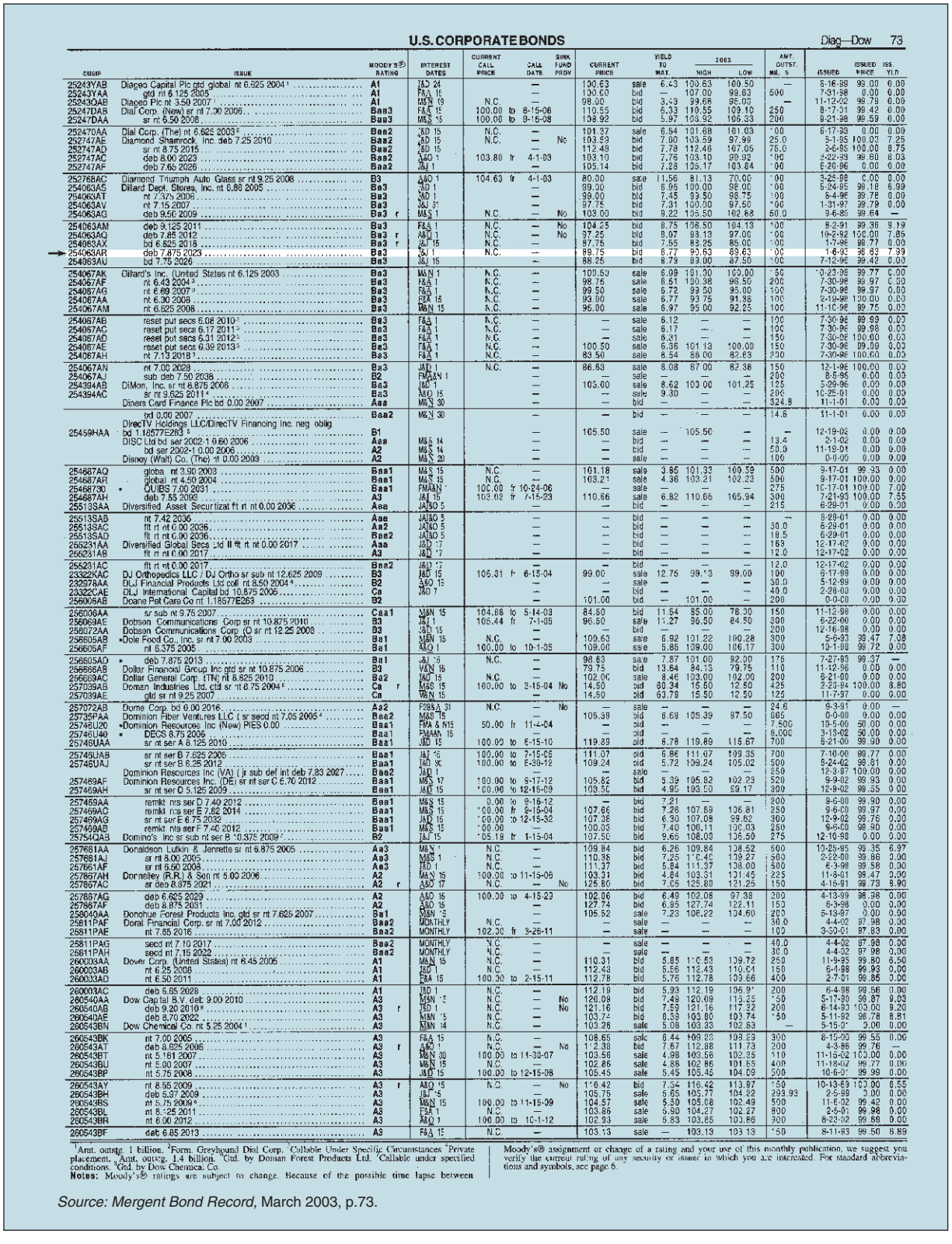
Table 16–1

Mergent Bond Record



U.S. CORPORATE BONDS — Diag—Dow 73

CUSIP	ISSUE	MOODY'S® RATING	INTEREST DATES	CURRENT CALL PRICE	CALL DATE	SINK FUND PROV	CURRENT PRICE		YIELD TO MAT.	2003 HIGH	2003 LOW	AMT. OUTST. MIL. $	ISSUED	ISSUED PRICE	ISS. YLD
25243YAB	Diageo Capital Plc gtd global nt 6.625 2004[1]	A1	JD 24		—		100.63	sale	6.23	100.63	100.50	—	6-16-98	99.00	0.00
25243YAA	gtd nt 6.125 2005	A1	FA 15		—		100.00	bid	—	107.00	99.63	500	7-31-98	0.00	0.00
252433QAB	Diageo Plc nt 3.50 2007	A1	MN 19	N.C.	—		98.00	bid	3.43	99.68	95.00	—	11-12-02	98.79	0.00
25247DAB	Dial Corp. (New) sr nt 7.00 2006	Baa3	FA 15	100.00 to	8-15-06		110.55	bid	6.33	110.55	109.10	250	8-17-01	99.42	0.00
25247DAA	sr nt 6.50 2008	Baa3	MS 15	100.00 to	9-15-08		109.92	bid	5.97	109.92	106.33	200	9-21-98	99.59	0.00
252470AA	Dial Corp. (The) nt 6.625 2003[2]	Baa2	JD 15	N.C.	—		101.37	sale	6.54	101.68	101.03	100	6-17-93	0.00	0.00
252747AE	Diamond Shamrock, Inc. deb 7.25 2010	Baa2	JD 15	N.C.	—	No	103.59	bid	7.00	103.59	97.99	25.0	5-1-95	100.00	7.25
252747AD	sr nt 8.75 2015	Baa2	JD 15	—	—		112.48	bid	7.78	112.48	107.05	75.0	2-6-95	100.00	8.75
252747AC	deb 8.00 2023	Baa2	AO 1	103.80 fr	4-1-03		103.10	bid	7.76	103.10	99.92	100	3-22-93	99.60	8.03
252747AF	deb 7.6b 2026	Baa2	JJ 1	—	—		105.14	bid	7.28	105.17	103.64	100	6-20-96	0.00	0.00
252768AC	Diamond Triumph Auto Glass sr nt 9.25 2008	B3	AO 1	104.63 fr	4-1-03		80.00	sale	11.56	81.13	70.00	100	3-25-98	0.00	0.00
254063AS	Dillard Dept. Stores, Inc. nt 6.88 2005	Ba3	JD 1	—	—		99.00	bid	6.95	100.00	98.00	100	5-24-95	99.18	6.99
254063AT	nt 7.375 2006	Ba3	JD 1	—	—		99.00	bid	7.45	99.50	98.75	100	6-4-96	99.78	0.00
254063AV	nt 7.15 2007	Ba3	JJ 31	—	—		97.75	bid	7.31	100.00	97.50	100	1-31-97	99.79	0.00
254063AG	deb 9.50 2009	Ba3 r	MS 1	N.C.	—	No	103.00	bid	9.22	105.50	102.88	50.0	9-6-89	99.64	—
254063AM	deb 9.125 2011	Ba3	FA 1	N.C.	—	No	104.25	bid	8.75	106.50	104.13	100	8-2-91	99.38	9.19
254063AQ	deb 7.85 2012	Ba3 r	AO 1	N.C.	—	No	97.25	bid	8.07	98.13	97.00	100	10-2-92	100.00	7.85
254063AX	bd 6.625 2018	Ba3 r	JJ 15	N.C.	—		87.75	bid	7.55	88.25	85.00	100	1-7-98	99.77	0.00
254063AR	deb 7.875 2023	Ba3	JJ 1	N.C.	—		89.75	bid	8.77	90.63	89.63	100	1-6-93	98.63	7.99
254063AU	bd 7.75 2026	Ba3	JJ 15	—	—		88.25	bid	8.79	89.00	87.50	100	7-12-96	99.42	0.00
254067AK	Dillard's Inc. (United States nt 6.125 2003	Ba3	MN 1	N.C.	—		100.50	sale	6.09	101.00	100.00	50	10-23-96	99.77	0.00
254067AF	nt 6.43 2004[3]	Ba3	FA 1	N.C.	—		98.75	sale	6.51	100.38	98.50	200	7-30-96	99.97	0.00
254067AG	nt 6.69 2007[3]	Ba3	FA 1	N.C.	—		99.50	sale	6.72	99.50	95.00	100	7-30-96	99.97	0.00
254067AA	nt 6.30 2008	Ba3	FA 15	N.C.	—		93.00	sale	6.77	93.75	91.38	100	2-19-98	100.00	0.00
254067AM	nt 6.625 2008	Ba3	MN 15	N.C.	—		96.00	sale	6.97	96.00	92.25	100	11-10-98	99.75	0.00
254067AB	reset put secs 6.08 2010[3]	Ba3	FA 1	N.C.	—		—	sale	6.12	—	—	100	7-30-96	99.99	0.00
254067AC	reset put secs 6.17 2011[3]	Ba3	FA 1	N.C.	—		—	sale	6.17	—	—	100	7-30-96	99.98	0.00
254067AD	reset put secs 6.31 2012[3]	Ba3	FA 1	N.C.	—		—	sale	6.31	—	—	150	7-30-96	100.00	0.00
254067AE	reset put secs 6.39 2013[3]	Ba3	FA 1	N.C.	—		100.50	sale	6.36	101.13	100.00	150	7-30-96	99.99	0.00
254067AH	nt 7.13 2018[3]	Ba3	FA 1	N.C.	—		83.50	sale	8.54	86.00	82.63	200	7-30-96	100.00	0.00
254067AN	nt 7.00 2028	Ba3	JD 1	N.C.	—		86.63	sale	8.08	87.00	82.38	150	12-1-96	100.00	0.00
254067AJ	sub deb 7.50 2036	Ba3	FMAN 1	—	—		—	sale	—	—	—	200	8-8-96	0.00	0.00
254394AB	DiMon, Inc. sr nt 8.875 2006	Ba3	JD 1	—	—		103.00	sale	8.62	103.00	101.25	125	5-29-96	0.00	0.00
254394AC	sr nt 9.625 2011[4]	Ba3	AO 15	—	—		—	sale	9.30	—	—	200	10-25-01	0.00	0.00
	Diners Card Finance Plc bd 0.00 2007	Aaa	MN 30	—	—		—	bid	—	—	—	324.8	11-1-01	0.00	0.00
	bd 0.00 2007	Baa2	MN 30	—	—		—	bid	—	—	—	14.6	11-1-01	0.00	0.00
25459HAA	DirecTV Holdings LLC/DirecTV Financing Inc. neg oblig bd 1.18577E263[5]	B1		—	—		105.50	sale	—	105.50	—	—	12-19-03	0.00	0.00
	DISC Ltd bd ser2002-1 0.00 2006	Aaa	MS 14	—	—		—	bid	—	—	—	13.4	2-1-02	0.00	0.00
	bd ser 2002-1 0.00 2006	A2	MS 14	—	—		—	bid	—	—	—	50.9	11-19-01	0.00	0.00
	Disney (Walt) Co. (The) nt 0.00 2003	A2	MS 20	—	—		—	sale	—	—	—	100	0-0-00	0.00	0.00
254687AQ	globa nt 3.90 2003	Baa1	MS 15	N.C.	—		101.18	sale	3.85	101.33	100.59	500	9-17-01	99.93	0.00
254687AR	global nt 4.50 2004	Baa1	MS 15	N.C.	—		103.21	sale	4.36	103.21	102.23	500	9-17-01	100.00	0.00
2546873Q	• QUIBS 7.00 2031	Baa1	FMAN	100.00 fr	10-24-06		—	sale	—	—	—	275	10-17-01	100.00	7.00
254687AH	deb 7.55 2093	A3	JJ 15	100.00 fr	7-15-23		110.66	sale	6.82	110.66	105.94	300	7-21-93	100.00	7.55
25513SAA	Diversified Asset Securitizat flt rt nt 0.00 2036	Aaa	JAJO 5	—	—		—	bid	—	—	—	215	6-29-01	0.00	0.00
25513SAB	nt 7.42 2036	Aaa	JAJO 5	—	—		—	bid	—	—	—	—	6-29-01	0.00	0.00
25513SAC	flt rt nt 0.00 2036	Aa2	JAJO 5	—	—		—	bid	—	—	—	30.0	6-29-01	0.00	0.00
25513SAD	flt rt nt 0.00 2036	Baa2	JAJO 5	—	—		—	bid	—	—	—	18.5	6-29-01	0.00	0.00
255231AA	Diversified Global Secs Ltd II flt rt nt 0.00 2017	Aaa	JD 17	—	—		—	bid	—	—	—	163	12-17-02	0.00	0.00
255231AB	flt rt nt 0.00 2017	A3	JD 17	—	—		—	bid	—	—	—	12.0	12-17-02	0.00	0.00
255231AC	flt rt nt 0.00 2017	Baa2	JD 17	—	—		—	bid	—	—	—	12.0	12-17-02	0.00	0.00
23322KAC	DJ Orthopedics LLC / DJ Ortho sr sub nt 12.625 2009	B3	JD 15	106.31 fr	6-15-04		99.00	sale	12.75	99.13	99.00	100	6-17-99	0.00	0.00
232978AA	DLJ Financial Products Ltd call nt 8.50 2004[6]	B2	AO 15	—	—		—	sale	—	—	—	30.0	4-28-00	0.00	0.00
23322QAE	DLJ International Capital bd 10.875 2005	Ca	JD 7	—	—		—	bid	—	—	—	40.0	2-28-00	0.00	0.00
256006AB	Doane Pet Care Co nt 1.18577E263	B2		—	—		101.00	bid	—	101.00	—	200	0-0-00	0.00	0.00
256006AA	sr sub nt 9.75 2007	Caa1	MSN 15	104.88 to	5-14-03		84.50	bid	11.54	85.00	78.00	150	11-12-98	0.00	0.00
256069AE	Dobson Communications Corp sr nt 10.875 2010	B3	JJ 1	105.44 fr	7-1-05		96.50	sale	11.27	96.50	84.50	300	6-22-00	0.00	0.00
256072AA	Dobson Communications Corp (O sr nt 12.25 2008	B3	JD 15	—	—		—	bid	—	—	—	200	12-16-98	0.00	0.00
256605AB	•Dole Food Co., Inc. sr nt 7.00 2003	Ba1	MSN 15	N.C.	—		100.63	sale	6.92	101.02	100.28	300	5-6-93	99.47	7.08
256605AF	nt 6.375 2005	Ba1	AO 1	100.00 to	10-1-05		109.00	sale	5.85	109.00	106.17	300	10-1-98	99.72	0.00
256605AD	• deb 7.875 2013	Ba1	JJ 15	N.C.	—		98.63	sale	7.87	101.00	92.00	175	7-27-93	99.37	—
256656AB	Dollar Financial Group Inc gtd sr nt 10.875 2006	B2	MSN 15	—	—		79.75	bid	13.84	84.13	79.75	110	11-12-96	0.00	0.00
256689AC	Dollar General Corp. (TN) nt 8.625 2010	Ba2	JAJO 15	N.C.	—		102.00	sale	8.46	103.00	102.00	200	6-21-00	0.00	0.00
257039AB	Domain Industries Ltd. gtd sr nt 8.75 2004[6]	Ca r	MAS 15	100.00 to	9-15-04	No	14.50	bid	60.34	15.50	12.50	425	2-23-94	100.00	8.80
257039AE	gtd sr nt 9.25 2007	Ca	MSN 15	—	—		14.50	bid	63.79	15.50	12.50	125	11-7-97	0.00	0.00
257072AB	Dome Corp. bd 0.00 2016	Aa2	FMAN 31	N.C.	—	No	—	sale	—	—	—	24.6	9-3-91	0.00	—
25735FAA	Dominion Fiber Ventures LLC (sr secd nt 7.05 2005[4]	Baa2	MAS 15	—	—		105.39	bid	6.69	105.39	97.50	665	0-0-00	0.00	0.00
25746U20	•Dominion Resources, Inc (New) PIES 0.00	Baa1	PMA & N15	50.00 fr	11-4-04		—	bid	—	—	—	7.500	10-5-00	50.00	0.00
25746UAG	• DECS 6.75 2006	Baa1	FMAN 15	—	—		—	bid	—	—	—	6.000	3-13-02	50.00	0.00
25746UAA	sr nt ser A 8.125 2010	Baa1	JD 15	100.00 to	6-15-10		119.89	bid	6.78	119.89	115.67	700	8-21-00	99.90	0.00
25745UAB	sr nt ser B 7.625 2005	Baa1	JJ 15	100.00 to	7-15-05		111.07	bid	6.86	111.07	109.35	700	7-10-00	99.77	0.00
25746UAJ	sr nt ser B 8.25 2012	Baa1	JD 15	100.00 to	6-30-12		109.24	bid	5.72	109.24	105.02	500	6-24-02	99.81	0.00
	Dominion Resources Inc (VA) (Jr sub def int deb 7.83 2027	Baa2	JJ 1	—	—		—	sale	—	—	—	250	12-3-97	100.00	0.00
257489AF	Dominion Resources Inc. (DE) sr nt ser C 6.70 2012	Baa1	MS 17	100.00 to	9-17-12		105.82	bid	5.39	105.82	102.23	520	9-9-02	99.93	0.00
257469AH	sr nt ser D 5.125 2009	Baa1	JD 15	100.00 to	12-15-09		103.50	bid	4.95	103.50	99.17	300	12-9-02	99.55	0.00
257469AA	remkt nts ser D 7.40 2012	Baa1	MS 15	0.00 to	9-16-12		—	bid	7.21	—	—	300	9-6-00	99.90	0.00
257469AC	remkt nts ser E 7.82 2014	Baa1	MS 15	100.00 fr	9-15-04		107.66	bid	7.26	107.69	106.81	250	9-6-00	99.97	0.00
257469AG	sr nt ser E 6.75 2032	Baa1	JD 15	100.00 to	12-15-32		107.08	bid	6.30	107.08	99.62	300	12-9-02	99.76	0.00
257469AB	remkt nts ser F 7.40 2012	Baa1	MS 15	100.00	—		100.03	bid	7.40	100.11	100.03	250	9-6-00	99.90	0.00
25754QAB	Domino's Inc sr sub nt ser B 10.375 2009[7]	B2	JJ 15	105.19 fr	1-15-04		107.50	bid	9.65	108.00	106.50	275	12-10-98	0.00	0.00
257681AA	Donaldson Lufkin & Jenrette sr nt 6.875 2005	Aa3	MS 1	N.C.	—		109.84	bid	6.26	109.84	108.52	500	10-25-95	99.35	6.97
257681AJ	sr nt 8.00 2005	Aa3	MS 1	N.C.	—		110.35	bid	7.25	110.40	109.27	500	2-22-00	99.88	0.00
257661AF	sr nt 9.60 2008	Aa3	JD 1	N.C.	—		111.37	bid	5.84	111.37	108.00	500	6-3-98	99.56	0.00
257867AH	Donnelley (R.R.) & Sons nt 5.00 2006	A2	MN 15	100.00 to	11-15-06		103.31	bid	4.84	103.31	101.45	225	11-8-01	99.47	0.00
257867AC	sr deb 8.875 2021	A2 r	AO 17	N.C.	—	No	125.80	bid	7.05	125.80	121.25	150	4-16-91	98.73	8.90
257687AG	deb 6.625 2029	A2	AO 15	100.00 to	4-15-29		102.06	bid	6.49	102.08	97.38	200	4-13-99	98.98	0.00
257687AF	deb 8.875 2031	A2	AO 15	—	—		127.74	bid	6.95	127.74	122.11	150	6-3-98	0.00	0.00
258040AA	Donohue Forest Products Inc. gtd sr nt 7.625 2007	Ba1	MSN 15	—	—		105.52	sale	7.23	106.22	104.60	200	5-13-97	0.00	0.00
25811PAF	Doral Financial Corp. sr nt 7.00 2012	Baa2	MONTHLY	N.C.	—		—	sale	—	—	—	30.0	4-4-02	97.98	0.00
25811PAE	nt 7.65 2016	Baa2	MONTHLY	102.30 fr	3-26-11		—	sale	—	—	—	100	3-30-01	97.83	0.00
25811PAG	secd nt 7.10 2017	Baa2	MONTHLY	N.C.	—		—	sale	—	—	—	40.0	4-4-02	97.98	0.00
25811PAH	secd nt 7.15 2022	Baa2	MONTHLY	N.C.	—		—	sale	—	—	—	30.0	4-4-02	97.98	0.00
260003AA	Dover Corp. (United States) nt 6.45 2005	A1	MN 15	N.C.	—		110.31	bid	5.85	110.53	109.72	250	11-9-95	99.80	6.50
260003AB	nt 6.25 2008	A1	JD 1	N.C.	—		112.43	bid	5.56	112.43	110.01	150	6-1-98	99.93	0.00
260003AD	nt 6.50 2011	A1	FA 15	100.00 to	2-15-11		112.78	bid	5.76	112.78	109.66	400	2-7-01	99.85	0.00
260003AC	deb 6.65 2028	A1	JD 1	N.C.	—		112.19	bid	5.93	112.19	106.91	200	6-4-98	99.56	0.00
260540AA	Dow Capital B.V. deb 9.00 2010	A3	MSN 15	N.C.	—	No	120.08	bid	7.49	120.09	115.25	150	5-17-90	99.87	9.03
260540AB	deb 9.20 2010[8]	A3 r	JD 1	N.C.	—	No	121.16	bid	7.59	121.16	117.32	200	6-14-93	100.00	9.20
260540AE	deb 8.70 2022	A3	MSN 15	N.C.	—		103.74	bid	8.39	103.80	103.74	150	5-11-92	98.78	8.81
260543BN	Dow Chemical Co. nt 5.25 2004[1]	A3	MSN 14	N.C.	—		103.26	sale	5.08	103.33	102.83	—	5-15-01	0.00	0.00
260543BK	nt 7.00 2005	A3	FA 15	N.C.	—		108.65	sale	6.44	109.23	108.29	300	8-15-00	99.55	0.00
260543AT	deb 8.625 2006	A3 r	AO 1	N.C.	—	No	112.38	bid	7.67	112.98	111.73	200	4-3-86	99.76	—
260543BT	nt 5.161 2007	A3	MN 30	100.00 to	11-30-07		103.56	sale	4.98	103.56	102.25	110	11-15-02	100.00	0.00
260543BU	nt 5.00 2007	A3	MN 15	N.C.	—		102.86	sale	4.86	102.86	101.65	400	11-18-02	99.77	0.00
260543BP	nt 5.75 2008	A3	JD 15	100.00 to	12-15-08		105.45	sale	5.45	105.45	104.09	500	10-6-03	99.99	0.00
260543AY	nt 8.55 2009	A3 r	AO 15	N.C.	—	No	116.42	bid	7.34	116.42	113.97	150	10-13-89	100.00	8.55
260543BH	deb 5.97 2009	A3	JJ 15	—	—		105.76	sale	5.65	105.77	104.22	293.93	2-5-99	0.00	0.00
260543BS	nt 5.75 2009[4]	A3	MSN 15	100.00 to	11-15-09		104.57	sale	5.30	105.08	102.49	500	11-6-02	99.42	0.00
260543BL	nt 6.125 2011	A3	FA 1	N.C.	—		103.86	sale	5.90	104.27	102.27	800	2-5-01	99.98	0.00
260543BR	nt 6.00 2012	A3	AO 1	100.00 to	10-1-12		102.93	sale	5.83	103.85	103.86	300	8-23-02	99.69	0.00
260543BF	deb 6.85 2013	A3	FA 15	N.C.	—		103.13	sale	—	103.13	103.13	150	8-11-93	99.50	6.89

[1]Amt. outstg. 1 billion. [2]Form. Greyhound Dial Corp. [3]Callable Under Specific Circumstances [4]Private placement. Amt. outstg. 1.4 billion. [5]Gtd. by Domain Forest Products Ltd. [6]Callable under specified conditions. [7]Gtd. by Dow Chemical Co.

Notes: Moody's® ratings are subject to change. Because of the possible time lapse between Moody's® assignment or change of a rating and your use of this monthly publication, we suggest you verify the current rating of any security or issuer in which you are interested. For standard abbreviations and symbols, see page 6.

Source: Mergent Bond Record, March 2003, p.73.

Table 16–2
Dillard's Bond Offering

DILLARD'S 7.875% BONDS DUE JANUARY 1, 2023

Moody's Rating: Ba3
Indenture Date: January 1, 1993
Authorized: $100,000,000
Outstanding: $100,000,000
Security of Obligation: A direct unsecured obligation
Interest Payable: January 1, July 1
Grace Period: 30 days
Trustee: Chase Manhattan Bank
Call Feature: Noncallable
Trading Exchange: OTC

Price Range

Year	High	Low
2002	95.500	87.250
2001	88.660	69.520
2000	93.000	61.875
1999	110.375	92.250
1998	114.000	108.875
1997	112.325	98.250

Source: Mergent's Industrial Manual, 2003, p. 1244.

$640.[1] Though most bonds are virtually certain to be redeemed at their face value at maturity ($1,000 in this case), this is small consolation to the bondholder who has many decades to wait. At times, bonds also greatly increase in value, such as they did in 1984–85, 1990–92, 1994–95, and 2003.

As indicated in the paragraph above and in Chapter 10, the price of a bond is directly tied to current interest rates. One exception to this rule was discussed at the beginning of the chapter; that is, when survival becomes a key factor in pricing and valuation. We will look at the more normal case where interest rates are the key factor in determining price.

A bond paying 5.10 percent ($51 a year) will fare quite poorly when the going market rate is 8.10 percent ($81 a year). To maintain a market in the older issue, the price is adjusted downward to reflect current market demands. The longer the life of the issue, the greater the influence of interest rate changes on the price of the bond.[2] The same process will work in reverse if interest rates go down. A 30-year, $1,000 bond initially issued to yield 8.10 percent would go up to $1,500 if interest rates declined to 5.10 percent (assuming the bond is not callable). A further illustration of interest rate effects on bond prices is presented in Table 16–3 on page 474 for a bond paying 12 percent interest. Observe that not only interest rates in the market but also years to maturity have a strong influence on bond prices.

[1]Bond prices are generally quoted as a percentage of original par value. In this case the quote would read 64.
[2]This is known as Malkiel's second theory of bonds. In fact it is only completely true when the coupon rate of the bond equals or is greater than the original discount rate.

Table 16–3
Bond price table

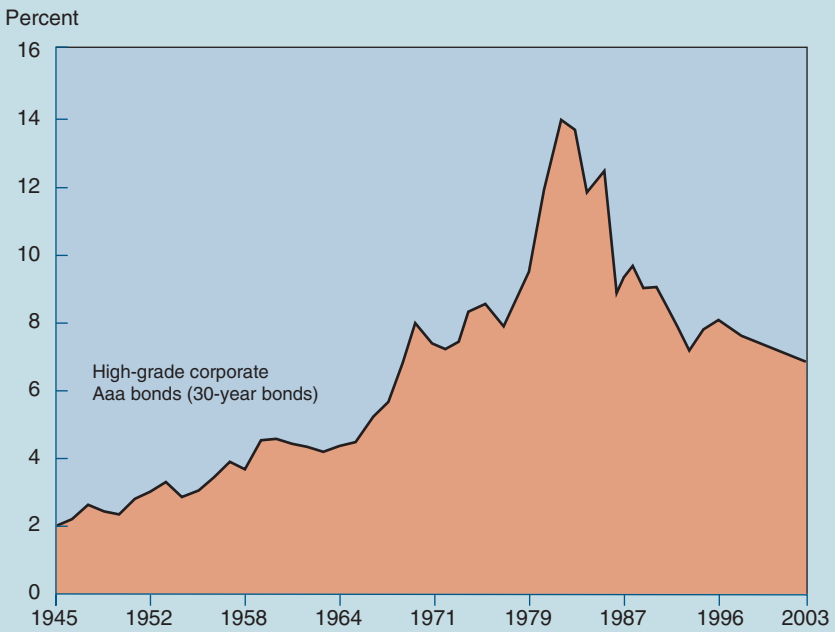
Interest Rates and Bond Prices (the bond pays 12% interest)

Years to Maturity	Rate in the Market (%)—Yield to Maturity*				
	8%	10%	12%	14%	16%
1	$1,038.16	$1,018.54	$1,000	$981.48	$963.98
15	1,345.52	1,153.32	1,000	875.54	774.48
25	1,429.92	1,182.36	1,000	862.06	754.98

*The prices in the table are based on semiannual interest, but you enter the table with annual values.

From 1945 through the early 1980s, the pattern had been for long-term interest rates to move upward (Figure 16–3). However, long-term interest rates have generally been declining since 1982.

Figure 16–3
Long-term yields on debt



Bond Yields

Bond yields are quoted three different ways: **coupon rate**, **current yield**, and **yield to maturity**. We will apply each to a $1,000 par value bond paying $100 per year interest for 10 years. The bond is currently priced at $900.

Coupon Rate (Nominal Yield) Stated interest payment divided by the par value.

$$\frac{\$100}{\$1{,}000} = 10\%$$

Current Yield Stated interest payment divided by the current price of the bond.

$$\frac{\$100}{\$900} = 11.11\%$$

Yield to Maturity The yield to maturity is the interest rate that will equate future interest payments and the payment at maturity (principal payment) to the current market price. This represents the concept of the internal rate of return. In the present case, an interest rate of approximately 11.70 percent will equate interest payments of $100 for 10 years and a final payment of $1,000 to the current price of $900. A simple formula may be used to approximate yield to maturity.[3] This formula was initially presented in Chapter 10.

$$\text{Approximate yield to maturity } (Y') = \frac{\text{Annual interest payment} + \dfrac{\text{Principal payment} - \text{Price of the bond}}{\text{Number of years to maturity}}}{0.6\,(\text{Price of the bond}) + 0.4\,(\text{Principal payment})} \quad (16\text{–}1)$$

$$Y' = \frac{\$100 + \dfrac{\$1{,}000 - 900}{10}}{0.6(\$900) + 0.4(\$1{,}000)}$$

$$= \frac{\$100 + \dfrac{\$100}{10}}{\$540 + \$400}$$

$$Y' = \frac{\$100 + \$10}{\$940} = \frac{\$110}{\$940} = \boxed{11.70\%}$$

Extensive bond tables indicating yield to maturity are also available. Calculators and computers may also be used to determine yield to maturity. When financial analysts speak of bond yields, the general assumption is that they are speaking of yield to maturity. This is deemed to be the most significant measure of return.

Bond Ratings

Both the issuing corporation and the investor are concerned about the rating their bond is assigned by the two major bond rating agencies—Moody's Investor Service and Standard & Poor's Corporation. The higher the rating assigned a given issue, the lower the required interest payments are to satisfy potential investors. This is because highly rated bonds carry lower risk. A major industrial corporation may be able to issue a 30-year bond at 6.5 to 7 percent yield to maturity because it is rated Aaa, whereas a smaller, regional firm may only qualify for a B rating and be forced to pay 9 or 10 percent.

As an example of **bond rating** systems, Moody's Investor Service provides the following nine categories of ranking:

Aaa Aa A Baa Ba B Caa Ca C

The first two categories of bond ratings represent the highest quality (for example, IBM and Procter & Gamble); the next two, medium to high quality; and so on.

[3]The exact answer can be found through the procedures in Appendix 10B covering financial calculators.

Beginning in 1982, Moody's began applying numerical modifiers to categories Aa through B: 1 is the highest in a category, 2 is the midrange, and 3 is the lowest. Thus, a rating of Aa2 means the bond is in the midrange of Aa. Standard & Poor's has a similar letter system with + and − modifiers.

Bonds receive ratings based on the corporation's ability to make interest payments, its consistency of performance, its size, its debt-equity ratio, its working capital position, and a number of other factors. The yield spread between higher- and lower-rated bonds changes with the economy. If investors are pessimistic about economic events, they will accept as much as 3 percent less return to go into securities of very high quality, whereas in more normal times the spread may be only 1.5 percent.

Examining Actual Bond Ratings

Three actual bond offerings are presented in Table 16–4 to illustrate the various terms we have used.

Table 16–4
Outstanding bond issues (January 2003)

Name	Coupon	Type of Bond	Rating	Price	Yield to Maturity
United Technologies. . . .	8.75%	Debenture, due 2021	A2	$1,134.40	6.52%
First Union Corp. (North Carolina)	7.50	Subordinate bonds, due 2035	A1	1,185.40	6.33
Beverly Enterprises	8.625	Mortgage bonds, due 2008	Ba2	930.00	9.38

Source: *Mergent Bond Guide,* June 2003.

Recall that the true return on a bond is measured by yield to maturity (the last column of Table 16-4). The United Technologies bonds are unsecured, as indicated by the term *debenture.* The bonds are rated A2, or middle investment grade, and carry a price of $1,134.40. This price is higher than the par value or $1,000, because the interest rate at time of issue (8.75 percent coupon) is higher than the demanded yield to maturity of 6.52 percent in January 2003 for bonds of equal quality and maturity. The First Union Corporation bonds are subordinated bonds with a rating of Al and a yield to maturity of 6.33 percent. The Beverly Enterprises bonds are secured by a mortgage and rated Ba2, based on the corporation's overall outlook. Because they are relatively low in quality, they pay a yield to maturity of 9.38 percent (in spite of the fact they are secured in nature). The bonds in Table 16–4 can be refunded if the companies desire. The meaning and benefits of refunding will be made clear in the following section.

The Refunding Decision

Assume you are the financial vice-president for a corporation that has issued bonds at 11.75 percent, only to witness a drop in interest rates to 9.5 percent. If you believe interest rates will rise rather than sink further, you may wish to redeem the expensive 11.75 percent bonds and issue new debt at the prevailing 9.5 percent rate. This process is labeled a **refunding** operation. It is made feasible by the call provision that enables a corporation to buy back bonds at close to par, rather than at high market values, when interest rates are declining.

A Capital Budgeting Problem

The refunding decision involves outflows in the form of financing costs related to redeeming and reissuing securities, and inflows represented by savings in annual interest costs and tax savings. In the present case, we shall assume the corporation issued $10 million worth of 11.75 percent debt with a 25-year maturity and the debt has been on the books for five years. The corporation now has the opportunity to buy back the old debt at 10 percent above par (the call premium) and to issue new debt at 9.5 percent interest with a 20-year life. The underwriting cost for the old issue was $125,000, and the underwriting cost for the new issue is $200,000. We shall also assume the corporation is in the 35 percent tax bracket and uses a 6 percent discount rate for refunding decisions. Since the savings from a refunding decision are certain—unlike the savings from most other capital budgeting decisions—we use the aftertax cost of new debt as the discount rate, rather than the more generalized cost of capital.[4] Actually, in this case, the aftertax cost of new debt is 9.5 percent (1 − Tax rate), or 9.5% × 0.65 = 6.18%. We round to 6 percent. The facts in this example are restated as follows.

Restatement of facts

	Old Issue	New Issue
Size	$10,000,000	$10,000,000
Interest rate	11.75%	9.5%
Total life	25 years	20 years
Remaining life	20 years	20 years
Call premium	10%	—
Underwriting costs	$125,000	$200,000
Tax bracket	35%	
Discount rate	6%	

Let's go through the capital budgeting process of defining our outflows and inflows and determining the net percent value.

Step A—Outflow Considerations

1. *Payment of call premium*—The first outflow is the 10 percent call premium on $10 million, or $1 million. This prepayment penalty is necessary to call in the original issue. Being an *out-of-pocket* tax-deductible expense, the $1 million cash expenditure will cost us only $650,000 on an aftertax basis. We multiply the expense by (1 − Tax rate) to get the aftertax cost.

$$\$1{,}000{,}000\ (1 - T) = \$1{,}000{,}000\ (1 - 0.35) = \$650{,}000$$

$$\text{Net cost of call premium} = \$650{,}000$$

2. *Underwriting cost on new issue*—The second outflow is the $200,000 underwriting cost on the new issue. The actual cost is somewhat less because the payment is tax-deductible, though the write-off must be spread over the life of the bond. While the

[4]A minority opinion would be that there is sufficient similarity between the bond refunding decision and other capital budgeting decisions to disallow any specialized treatment. Also note that although the bondholders must still bear some risk of default, for which they are compensated, the corporation assumes no risk.

actual $200,000 is being spent now, equal tax deductions of $10,000 a year will occur over the next 20 years (in a manner similar to depreciation).

The tax savings from a *noncash* write-off are equal to the amount times the tax rate. For a company in the 35 percent tax bracket, $10,000 of annual tax deductions will provide $3,500 of tax savings each year for the next 20 years. The present value of these savings is the present value of a $3,500 annuity for 20 years at 6 percent interest:

$$\$3{,}500 \times 11.470 \ (n = 20, i = 6\%) = \$40{,}145$$

The net cost of underwriting the new issue is the actual expenditure now, minus the present value of future tax savings as indicated below.

Actual expenditure	$200,000
− PV of future tax savings	40,145
Net cost of underwriting expense on the new issue	$159,855

Step B—Inflow Considerations

The major inflows in the refunding decision are related to the reduction of annual interest expense and the immediate write-off of the underwriting cost on the old issue.

3. *Cost savings in lower interest rates*—The corporation will enjoy a 2.25 percentage point drop in interest rates, from 11.75 percent to 9.50 percent, on $10 million of bonds.

11.75% × $10,000,000	$1,175,000
9.50% × $10,000,000	950,000
Savings	$ 225,000

Since we are in the 35 percent tax bracket, this is equivalent to $146,250 of aftertax benefits per year for 20 years. We have taken the savings and multiplied by one minus the tax rate to get the annual aftertax benefits.

$$\$225{,}000 \ (1 - T)$$
$$\$225{,}000 \ (1 - 0.35)$$
$$\$146{,}250$$

Applying a 6 percent discount rate for a 20-year annuity:

$$\$146{,}250 \times 11.470 \ (n = 20, i = 6\%) = \$1{,}677{,}488$$

Cost savings in lower interest rates . . . $1,677,488

4. *Underwriting cost on old issue*—There is a further cost savings related to immediately writing off the remaining underwriting costs on the old bonds. Note that the initial amount of $125,000 was spent five years ago and was to be written off for tax purposes over 25 years at $5,000 per year. Since five years have passed, $100,000 of old underwriting costs have not been amortized as indicated in the following:

Original amount	$125,000
Written off over five years	25,000
Unamortized old underwriting costs	$100,000

A tax benefit is associated with the immediate write-off of old underwriting costs, which we shall consider shortly.

Note, however, that this is not a total gain. We would have gotten the $100,000 additional write-off eventually if we had not called in the old bonds. By calling them in now, we simply take the write-off sooner. If we extended the write-off over the remaining life of the bonds, we would have taken $5,000 a year for 20 years. Discounting this value, we show:

$$\$5{,}000 \times 11.470 \ (n = 20, i = 6\%) = \$57{,}350$$

Thus, we are getting a write-off of $100,000 now, rather than a present value of future write-offs of $57,350. The gain in immediate tax write-offs is $42,650. The tax savings from a *noncash* tax write-off equal the amount times the tax rate. Since we are in the 35 percent tax bracket, our savings from this write-off are $14,928. The following calculations, which were discussed above, are necessary to arrive at $14,928.

Immediate write-off	$100,000
− PV of future write-off	57,350
Gain from immediate write-off	$ 42,650

$42,650(T)

$42,650(.35) = $14,928

Net gain from the underwriting on the old issue $14,928

Step C—Net Present Value

We now compare our outflows and our inflows from the prior pages.

Outflows		Inflows	
1. Net cost of call premium	$650,000	3. Cost savings in lower interest rates	$1,677,488
2. Net cost of underwriting expense on new issue	159,855	4. Net gain from underwriting cost on old issue	14,928
	$809,855		$1,692,416

Present value of inflows	$1,692,416
Present value of outflows	809,855
Net present value	$ 882,561

The refunding decision has a positive net present value, suggesting that interest rates have dropped to a sufficiently low level to indicate refunding is in order. The only question is, Will interest rates go lower—indicating an even better time for refunding? There is no easy answer. Conditions in the financial markets must be carefully considered.

A number of other factors could be plugged into the problem. For example, there could be overlapping time periods in the refunding procedure when both issues are outstanding and the firm is paying double interest (hopefully for less than a month). The dollar amount in these cases, however, tends to be small and is not included in the analysis.

In working problems, the student should have minimum difficulty if he or she follows the four suggested calculations. In each of the four calculations we had the following tax implications:

1. Payment of call premium—the cost equals the amount times (1 − Tax rate) for this *cash tax-deductible expense.*
2. Underwriting costs on new issue—we pay an amount now and then amortize it over the life of the bond for tax purposes. This subsequent amortization is similar to depreciation and represents a *noncash write-off* of a tax-deductible expense. The tax saving from the amortization is equal to the amount times the tax rate.
3. Cost savings in lower interest rates—cost savings are like any form of income, and we will retain the cost savings times (1 − Tax rate).
4. Underwriting cost on old issue—once again, the writing off of underwriting costs represents a *noncash write-off* of a tax-deductible expense. The tax savings from the amortization are equal to the amount times the tax rate.

Other Forms of Bond Financing

As interest rates continued to show increasing volatility in the 1980s and early 1990s, two innovative forms of bond financing became very popular and remain so today. We shall examine the zero-coupon rate bond and the floating rate bond.

The **zero-coupon rate bond,** as the name implies, does not pay interest. It is, however, sold at a deep discount from face value. The return to the investor is the difference between the investor's cost and the face value received at the end of the life of the bond. For example, in early 1982, BankAmerica Corporation offered $1,000 zero-coupon rate bonds with maturities of 5, 8, and 10 years. The 5-year bonds were sold for $500, the 8-year bonds for $333.33, and the 10-year bonds for $250. All three provided an initial yield to maturity (through gain in value) of approximately 14.75 percent. A dramatic case of a zero-coupon bond was an issue offered by PepsiCo, Inc., in 1982, in which the maturities ranged from 6 to 30 years. The 30-year $1,000 par value issue could be purchased for $26.43, providing a yield of approximately 12.75 percent. The purchase price per bond of $26.43 represented only 2.643 percent of the par value. A million dollars worth of these 30-year bonds could be initially purchased for a mere $26,430.

The advantage to the corporation is that there is immediate cash inflow to the corporation, without any outflow until the bonds mature. Furthermore, the difference between the initial bond price and the maturity value may be amortized for tax purposes by the corporation over the life of the bond. This means the corporation will be taking annual deductions without current cash outflow.

From the investor's viewpoint, the zero-coupon bonds allow him or her to lock in a multiplier of the initial investment. For example, investors may know they will get three times their investment after a specified number of years. The major drawback is that the annual increase in the value of bonds is taxable as ordinary income as it accrues, even though the bondholder does not get any cash flow until maturity. For this reason most investors in zero-coupon rate bonds have tax-exempt or tax-deferred status (pension funds, foundations, charitable organizations, individual retirement accounts, and the like).

The prices of the bonds tend to be highly volatile because of changes in interest rates. Even though the bonds provide no annual interest payment, there is still an initial

yield to maturity that may prove to be too high or too low with changes in the marketplace.

The bonds of the first two companies listed in Table 16–5 are examples of zero-coupon bonds. The bonds sell at a considerable discount from par value of $1,000 since both have some time remaining until maturity. Note in the price column that the PepsiCo Capital Resources bonds are selling at the largest discount due to the long time to their maturity.

Table 16–5
Zero-coupon and floating rate bonds

	Rating	Coupon	Maturity	Price	Yield to Maturity
Zero-Coupon Bonds					
PepsiCo Capital Resources	A1	0.00%	2112	$589.40	6.86%
Honeywell International	A2	0.00	2009	705.00	7.13
Floating Rate Bonds					
CIT Group Holdings	Aa3	6.51	2011	998.25	6.52

Source: Mergent Bond Guide, January 2003.

A second type of innovative bond issue is the **floating rate bond** (long popular in European capital markets). In this case, instead of a change in the price of the bond, the interest rate paid on the bond changes with market conditions (usually monthly or quarterly). Thus, a bond that was initially issued to pay 9 percent may lower the interest payments to 6 percent during some years and raise them to 12 percent in others. The interest rate is usually tied to some overall market rate, such as the yield on Treasury bonds (perhaps 120 percent of the going yield on long-term Treasury bonds).

An example of a floating rate bond is the CIT Group Holdings, Inc., bond presented at the bottom of Table 16–5. Notice that the price of $998.25 is close to the $1,000 par value since the coupon adjusts with changes in market rates.

The advantage to investors in floating rate bonds is that they have a constant (or almost constant) market value for the security, even though interest rates vary. An exception is that floating rate bonds often have broad limits that interest payments cannot exceed. For example, the interest rate on a 9 percent initial offering may not be allowed to go over 16 percent or below 4 percent. If long-term interest rates dictated an interest payment of 20 percent, the payment would still remain at 16 percent. This could cause some short-term loss in market value. To date, floating rate bonds have been relatively free of this problem.

Zero-coupon rate bonds and floating rate bonds still represent a relatively small percentage of the total market of new debt offerings. Nevertheless, they should be part of a basic understanding of long-term debt instruments.

Advantages and Disadvantages of Debt

The financial manager must consider whether debt will contribute to or detract from the firm's operations. In certain industries, such as airlines, very heavy debt utilization is a way of life, whereas in other industries (drugs, photographic equipment) reliance is placed on other forms of capital.

Benefits of Debt

The advantages of debt may be enumerated as:

1. Interest payments are tax-deductible. Because the maximum corporate tax rate is in the mid-30 percent range, the effective aftertax cost of interest is approximately two-thirds of the dollar amount expended.
2. The financial obligation is clearly specified and of a fixed nature (with the exception of floating rate bonds). Contrast this with selling an ownership interest in which stockholders have open-ended participation in profits; however, the amount of profits is unknown.
3. In an inflationary economy, debt may be paid back with "cheaper dollars." A $1,000 bond obligation may be repaid in 10 or 20 years with dollars that have shrunk in value by 50 or 60 percent. In terms of "real dollars," or purchasing power equivalents, one might argue that the corporation should be asked to repay something in excess of $2,000. Presumably, high interest rates in inflationary periods compensate the lender for loss in purchasing power, but this is not always the case.
4. The use of debt, up to a prudent point, may lower the cost of capital to the firm. To the extent that debt does not strain the risk position of the firm, its low aftertax cost may aid in reducing the weighted overall cost of financing to the firm.

Drawbacks of Debt

Finally, we must consider the disadvantages of debt:

1. Interest and principal payment obligations are set by contract and must be met, regardless of the economic position of the firm.
2. Indenture agreements may place burdensome restrictions on the firm, such as maintenance of working capital at a given level, limits on future debt offerings, and guidelines for dividend policy. Although bondholders generally do not have the right to vote, they may take virtual control of the firm if important indenture provisions are not met.
3. Utilized beyond a given point, debt may depress outstanding common stock values.

Eurobond Market

A market with an increasing presence in world capital markets is that in Eurobonds. A **Eurobond** may be defined as a bond payable in the borrower's currency but sold outside the borrower's country. The Eurobond is usually sold by an international syndicate of investment bankers and includes bonds sold by companies in Switzerland, Japan, the Netherlands, Germany, the United States, and Britain, to name the most popular countries. An example might be a bond of a U.S. company, payable in dollars and sold in London, Paris, Tokyo, or Frankfurt. Disclosure requirements in the Eurobond market are less demanding than those of the Securities and Exchange Commission or other domestic regulatory agencies. Examples of several Eurobonds are presented in Table 16–6.

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For Companies with Financial Problems, Thank Heaven for Chapter 11

The intent of the Chapter 11 Bankruptcy Act is to provide protection for companies in financial distress. Under the supervision of a trustee (appointed by the court), the firm is given temporary immunity against its creditors while a feasible plan to meet some or all of its debt obligation is developed (the topic is covered further in Appendix 16A).

Some would suggest that many companies are not using Chapter 11 to restructure their debt, but as a strategic tool in everything from litigation defense to merger negotiations.* The potential for using Chapter 11 as a strategic ploy became most evident in the 1980s when Johns Manville used Chapter 11 to avoid the full consequences of a class action suit covering asbestos as part of its product content. Rather than wait for an overburdening damage finding in a lawsuit, it declared Chapter 11 bankruptcy. The court's temporary protection allowed the firm to work out its damage obligations over time. It is now a successful company again and was acquired for $2.4 billion by Berkshire Hathaway in June 2000. Giant oil company Texaco used a similar strategy to avert the full impact of the damages awarded to plaintiffs after its failed takeover attempt of Pennzoil.

More recently, additional uses are being found for using Chapter 11. When acquiring companies in a merger have strong fears about the financial strength of the company being acquired (or potential lawsuits against the company in the future), they will require the merger candidate to file for Chapter 11 protection as a precondition of the merger. This was the case when Washington Construction Company acquired Morrison Knudson Corp. in 1996 and was Mattel's strategy when it bought Purple Moon Media in 1999.

Going all the way back to the Great Depression of the 1930s, there has been a horrible stigma associated with bankruptcy. People used to whisper about a prior bankruptcy in much the same way they might about a person having a convicted felon as a relative. In these more tolerant times, companies and individuals are less fearful of the damage to their reputations. Whether this is a good thing or not is subject to debate. Nevertheless, many who have gone down the Chapter 11 bankruptcy route are quick to say, "Thank Heaven for Chapter 11."

*Dean Foust, "Chapter 11 Never Looked So Good," *Business Week*, March 20, 2000, p. 44.

FINANCE in ACTION

www.texaco.com

www.pennzoil.com

www.wgint.com

www.mattel.com

www.berkshirehathaway.com

Table 16–6
Examples of Eurobonds

	Rating	Coupon	Maturity	Amount Outstanding ($ millions)	Currency Denomination*
Petro-Canada	Baa1	9.25%	2021	300.0	C$
Procter & Gamble Co. . . .	Aa2	10.88	2010	200.0	U.S.$
Sony Corporation	Aa3	1.40	2007	300.0	Yen

*C$ is Canadian dollar.
Source: *Mergent Bond Record*, March 2003.

Leasing as a Form of Debt

When a corporation contracts to lease an oil tanker or a computer and signs a noncancelable, long-term agreement, the transaction has all the characteristics of a debt obligation. Long-term leasing was not recognized as a debt obligation in the early post–World War II period, but since the mid-60s there has been a strong movement by the accounting profession to force companies to fully divulge all information about leasing obligations and to indicate the equivalent debt characteristics.

This position was made official for financial reporting purposes as a result of *Statement of Financial Accounting Standards (SFAS) No. 13,* issued by the Financial Accounting Standards Board (FASB) in November 1976. This statement said certain types of leases must be shown as long-term obligations on the financial statements of the firm. Before *SFAS No. 13,* lease obligations could merely be divulged in footnotes to financial statements, and large lease obligations did not have to be included in the debt structure (except for the upcoming payment). Consider the case of Firm ABC, whose balance sheet is shown in Table 16–7.

Table 16–7
Balance sheet
($ millions)

Current assets	$ 50	Current liabilities	$ 50
Fixed assets	150	Long-term liabilities	50
		Total liabilities	100
		Stockholders' equity	100
Total assets	$200	Total liabilities and stockholders' equity	$200

Before the issuance of *SFAS No. 13,* a footnote to the financial statements might have indicated a lease obligation of $12 million a year for the next 15 years, with a present value of $100 million. With the issuance of *SFAS No. 13,* this information was moved directly to the balance sheet, as indicated in Table 16–8.

Table 16–8
Revised balance sheet
($ millions)

Current assets	$ 50	Current liabilities	$ 50
Fixed assets	150	Long-term liabilities	50
Leased property under capital lease*	100	Obligation under capital lease*	100
		Total liabilities	200
		Stockholders' equity	100
Total assets	$300	Total liabilities and stockholders' equity	$300

*See discussion below concerning this table.

We see that both a new asset and a new liability have been created, as indicated by the asterisks. The essence of this treatment is that a long-term, noncancelable lease is tantamount to purchasing the asset with borrowed funds, and this should be reflected on the balance sheet. Note that between the original balance sheet (Table 16–7) and the revised balance sheet (Table 16–8), the total-debt-to-total-assets ratio has gone from 50 percent to 66.7 percent.

$$\textit{Original:}\quad \frac{\text{Total debt}}{\text{Total assets}} = \frac{\$100 \text{ million}}{\$200 \text{ million}} = 50\%$$

$$\textit{Revised:}\quad \frac{\text{Total debt}}{\text{Total assets}} = \frac{\$200 \text{ million}}{\$300 \text{ million}} = 66.7\%$$

Though this represents a substantial increase in the ratio, the impact on the firm's credit rating or stock price may be minimal. To the extent that the financial markets are efficient, the information was already known by analysts who took the data from footnotes or other sources and made their own adjustments. Nevertheless, corporate financial officers fought long, hard, and unsuccessfully to keep the lease obligation off the balance sheet. They tend to be much less convinced about the efficiency of the marketplace.

Capital Lease versus Operating Lease

Not all leases must be capitalized (present-valued) and placed on the balance sheet. This treatment is necessary only when substantially all the benefits and risks of ownership are transferred in a lease. Under these circumstances, we have a **capital lease** (also referred to as a financing lease). Identification as a capital lease and the attendant financial treatment are required whenever any one of the four following conditions is present:

1. The arrangement transfers ownership of the property to the lessee (the leasing party) by the end of the lease term.
2. The lease contains a bargain purchase price at the end of the lease. The option price will have to be sufficiently low so exercise of the option appears reasonably certain.
3. The lease term is equal to 75 percent or more of the estimated life of the leased property.
4. The present value of the minimum lease payments equals 90 percent or more of the fair value of the leased property at the inception of the lease.[5]

A lease that does not meet any of these four criteria is not regarded as a capital lease, but as an **operating lease.** An operating lease is usually short-term and is often cancelable at the option of the lessee. Furthermore, the lessor (the owner of the asset) may provide for the maintenance and upkeep of the asset, since he or she is likely to get it back. An operating lease does not require the *capitalization,* or presentation, of the full obligation on the balance sheet. Operating leases are used most frequently with such assets as automobiles and office equipment, while capital leases are used with oil drilling equipment, airplanes and rail equipment, certain forms of real estate, and other long-term assets. The greatest volume of leasing obligations is represented by capital leases.

Income Statement Effect

The capital lease calls not only for present-valuing the lease obligation on the balance sheet but also for treating the arrangement for income statement purposes as if it were somewhat similar to a purchase-borrowing arrangement. Thus, under a capital lease, the intangible asset account previously shown in Table 16–8 as "Leased property under capital lease" is amortized, or written off, over the life of the lease with an annual

[5]The discount rate used for this test is the leasing firm's new cost of borrowing or the lessor's (the firm that owns the asset) implied rate of return under the lease. The lower of the two must be used when both are known.

expense deduction. Also, the liability account shown in Table 16–8 as "Obligation under capital lease" is written off through regular amortization, with an implied interest expense on the remaining balance. Thus, for financial reporting purposes the annual deductions are amortization of the asset, plus the implied interest expense on the remaining present value of the liability. Though the actual development of these values and accounting rules is best deferred to an accounting course, the finance student should understand the close similarity between a capital lease and borrowing to purchase an asset, for financial reporting purposes.

An operating lease, on the other hand, usually calls for an annual expense deduction equal to the lease payment, with no specific amortization, as is indicated in Appendix 16B, "Lease versus Purchase Decision," at the end of this chapter.

Advantages of Leasing

Why is leasing so popular? It has emerged as a trillion-dollar industry, with such firms as Clark Equipment, GECapital, and U.S. Leasing International providing an enormous amount of financing. Major reasons for the popularity of leasing include the following:

1. The lessee may lack sufficient funds or the credit capability to purchase the asset from a manufacturer, who is willing, however, to accept a lease arrangement or to arrange a lease obligation with a third party.
2. The provisions of a lease obligation may be substantially less restrictive than those of a bond indenture.
3. There may be no down payment requirement, as would generally be the case in the purchase of an asset (leasing allows for a larger indirect loan).
4. The lessor may possess particular expertise in a given industry—allowing for expert product selection, maintenance, and eventual resale. Through this process, the negative effects of obsolescence may be reduced.
5. Creditor claims on certain types of leases, such as real estate, are restricted in bankruptcy and reorganization proceedings. Leases on chattels (non-real estate items) have no such limitation.

There are also some tax factors to be considered. Where one party to a lease is in a higher tax bracket than the other party, certain tax advantages, such as depreciation write-off or research-related tax credits, may be better utilized. For example, a wealthy party may purchase an asset for tax purposes, then lease the asset to another party in a lower tax bracket for actual use. Also, lease payments on the use of land are tax-deductible, whereas land ownership does not allow a similar deduction for depreciation. It should be pointed out that tax advantages related to leasing were reduced somewhat with the passage of the Tax Reform Act of 1986.

Finally, a firm may wish to engage in a sale-leaseback arrangement, in which assets already owned by the lessee are sold to the lessor and then leased back. This process provides the lessee with an infusion of capital, while allowing the lessee to continue to use the asset. Even though the dollar costs of a leasing arrangement are often higher than the dollar costs of owning an asset, the advantages cited above may outweigh the direct cost factors.

Summary

Corporate bonds may be secured by a lien on a specific asset or may carry an unsecured designation, indicating the bondholder possesses a general claim against the corporation. A special discussion of the hierarchy of claims for firms in financial distress is presented in Appendix 16A.

Both the issuing corporation and the investor are concerned about the rating their bond is assigned by the two major bond rating agencies—Moody's Investor Service and Standard & Poor's Corporation. The higher the rating assigned a given issue, the lower the required interest payments needed to satisfy potential investors. This is because highly rated bonds carry lower risk.

Bond refundings may take place when interest rates are going down. The financial manager must consider whether the savings in interest will compensate for the additional cost of calling in the old issue and selling a new one.

The zero-coupon rate bond, as the name implies, does not pay interest. It is, however, sold at a deep discount from face value. The return to the investor is the difference between the investor's cost and the face value received at the end of the life of the bond.

A second type of innovative bond issue is the floating rate bond. In this case, instead of a change in the price of the bond, the interest rate paid on the bond changes with market conditions (usually monthly or quarterly).

When a corporation contracts to lease an oil tanker or a computer and signs a noncancelable, long-term agreement, the transaction has all the characteristics of a debt obligation, and should be recognized as such on the financial statements of the firm.

List of Terms

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Discussion Questions

1. Corporate debt has been expanding very dramatically since World War II. What has been the impact on interest coverage, particularly since 1977?
2. What are some specific features of bond agreements?
3. What is the difference between a bond agreement and a bond indenture?
4. Discuss the relationship between the coupon rate (original interest rate at time of issue) on a bond and its security provisions.

5. Take the following list of securities and arrange them in order of their priority of claims:

Preferred stock	Senior debenture
Subordinated debenture	Senior secured debt
Common stock	Junior secured debt

6. What method of "bond repayment" reduces debt and increases the amount of common stock outstanding?
7. What is the purpose of serial repayments and sinking funds?
8. Under what circumstances would a call on a bond be exercised by a corporation? What is the purpose of a deferred call?
9. Discuss the relationship between bond prices and interest rates. What impact do changing interest rates have on the price of long-term bonds versus short-term bonds?
10. What is the difference between the following yields: coupon rate, current yield, yield to maturity?
11. How does the bond rating affect the interest rate paid by a corporation on its bonds?
12. Bonds of different risk classes will have a spread between their interest rates. Is this spread always the same? Why?
13. Explain how the bond refunding problem is similar to a capital budgeting decision.
14. What cost of capital is generally used in evaluating a bond refunding decision? Why?
15. Explain how the zero-coupon rate bond provides return to the investor. What are the advantages to the corporation?
16. Explain how floating rate bonds can save the investor from potential embarrassments in portfolio valuations.
17. Discuss the advantages and disadvantages of debt.
18. What is a Eurobond?
19. What do we mean by capitalizing lease payments?
20. Explain the close parallel between a capital lease and the borrow–purchase decision from the viewpoint of both the balance sheet and the income statement.

Problems

(Assume the par value of the bonds in the following problems is $1,000 unless otherwise specified.)

Bond yields

1. The Pioneer Petroleum Corporation has a bond outstanding with an $85 annual interest payment, a market price of $800, and a maturity date in five years. Find the following:
   a. The coupon rate.
   b. The current rate.
   c. The approximate yield to maturity.

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Bond yields

2. Harold Reese must choose between two bonds:

   Bond X pays $95 annual interest and has a market value of $900. It has 10 years to maturity.

   Bond Z pays $95 annual interest and has a market value of $920. It has two years to maturity.

   a. Compute the current yield on both bonds.

   b. Which bond should he select based on your answer to part *a*?

   c. A drawback of current yield is that it does not consider the total life of the bond. For example, the approximate yield to maturity on Bond X is 11.17 percent. What is the approximate yield to maturity on Bond Z?

   d. Has your answer changed between parts *b* and *c* of this question?

Bond yields

3. An investor must choose between two bonds:

   Bond A pays $90 annual interest and has a market value of $850. It has 10 years to maturity.

   Bond B pays $80 annual interest and has a market value of $900. It has two years to maturity.

   a. Compute the current yield on both bonds.

   b. Which bond should he select based on your answer to part *a*?

   c. A drawback of current yield is that it does not consider the total life of the bond. For example, the approximate yield to maturity on Bond A is 11.54 percent. What is the approximate yield to maturity on Bond B?

   d. Has your answer changed between parts *b* and *c* of this question in terms of which bond to select?

Secured vs. unsecured debt

4. Match the yield to maturity in column 2 with the security provisions (or lack thereof) in column 1. Higher returns tend to go with greater risk.

(1) Security Provision	(2) Yield to Maturity
a. Debenture	*a.* 6.85%
b. Secured debt	*b.* 8.20%
c. Subordinated debenture	*c.* 7.76%

Bond value

5. The Southeast Investment Fund buys 70 bonds of the Hillary Bakery Corporation through its broker. The bonds pay 9 percent annual interest. The yield to maturity (market rate of interest) is 12 percent. The bonds have a 25-year maturity. Using an assumption of semiannual interest payments:

   a. Compute the price of a bond (refer to "semiannual interest and bond prices" in Chapter 10 for review if necessary).

   b. Compute the total value of the 70 bonds.

Bond value

6. Sanders & Co. pays a 12 percent coupon rate on debentures that are due in 20 years. The current yield to maturity on bonds of similar risk is 10 percent. The bonds are currently callable at $1,060. The theoretical value of the bonds will be equal to the present value of the expected cash flow from the bonds. This is the normal definition we use.

   a. Find the theoretical market value of the bonds using semiannual analysis.

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b. Do you think the bonds will sell for the price you arrived at in part *a*? Why?

Effect of bond rating change

7. The yield to maturity for 25-year bonds is as follows for four different bond rating categories:

Aaa	9.4%	Aa2	10.0%
Aal	9.6%	Aa3	10.2%

The bonds of Evans Corporation were rated as Aal and issued at par a few weeks ago. The bonds have just been downgraded to Aa2. Determine the new price of the bonds, assuming a 25-year maturity and semiannual interest payments. As a first step, use the data above as a guide to appropriate interest rates for bonds with different ratings.

Interest rates and bond ratings

8. Twenty-five-year B-rated bonds of Parker Optical Company were initially issued at a 12 percent yield. After 10 years the bonds have been upgraded to Aa2. Such bonds are currently yielding 10 percent to maturity. Use Table 16–3 on page 474 to determine the price of the bonds with 15 years remaining to maturity. (You do not need the bond ratings to enter the table; just use the basic facts of the problem.)

Interest rates and bond ratings

9. A previously issued Aal, 20-year industrial bond provides a return one-fourth higher than the prime interest rate assumed to be at 8 percent. Previously issued public utility bonds provide a yield of three-fourths of a percentage point higher than previously issued industrial bonds of equal quality. Finally, new issues of Aa1 public utility bonds pay one-fourth of a percentage point more than previously issued public utility bonds.

What should the interest rate be on a newly issued Aa1 public utility bond?

Zero-coupon bond values

10. A 15-year, $1,000 par value zero-coupon rate bond is to be issued to yield 10 percent.

a. What should be the initial price of the bond? (Take the present value of $1,000 to be received after 15 years at 10 percent, using Appendix B at the back of the text.)

b. If immediately upon issue, interest rates dropped to 8 percent, what would be the value of the zero-coupon rate bond?

c. If immediately upon issue, interest rates increased to 12 percent, what would be the value of the zero-coupon rate bond?

Zero-coupon bond yield

11. What is the effective yield to maturity on a zero-coupon bond that sells for $131 and will mature in 30 years at $1,000? (Compute PV_{IF} and go to Appendix B for the 30-year figure to find the answer or compute FV_{IF} and go to Appendix A for the 30-year figure to find the answer. Either approach will work.)

Floating rate bond

12. You buy an 8 percent, 25-year, $1,000 par value floating rate bond in 1999. By the year 2004, rates on bonds of similar risk are up to 11 percent. What is your one best guess as to the value of the bond?

Effect of inflation on purchasing power of bond

13. Fourteen years ago, the U.S. Aluminum Corporation borrowed $9.9 million. Since then, cumulative inflation has been 98 percent (a compound rate of approximately 5 percent per year).

a. When the firm repays the original $9.9 million loan this year, what will be the effective purchasing power of the $9.9 million? (Hint: Divide the loan amount by one plus cumulative inflation.)

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b. To maintain the original $9.9 million purchasing power, how much should the lender be repaid? (Hint: Multiply the loan amount by one plus cumulative inflation.)

c. If the lender knows he will receive only $9.9 million in payment after 14 years, how might he be compensated for the loss in purchasing power? A descriptive answer is acceptable.

14. A $1,000 par value bond was issued 25 years ago at a 12 percent coupon rate. It currently has 15 years remaining to maturity. Interest rates on similar obligations are now 8 percent. Profit potential associated with margin

a. What is the current price of the bond? (Look up the answer in Table 16–3 on page 474.)

b. Assume Ms. Bright bought the bond three years ago when it had a price of $1,050. What is her dollar profit based on the bond's current price?

c. Further assume Ms. Bright paid 30 percent of the purchase price in cash and borrowed the rest (known as buying on margin). She used the interest payments from the bond to cover the interest costs on the loan. How much of the purchase price of $1,050 did Ms. Bright pay in cash?

d. What is Ms. Bright's percentage return on her cash investment? Divide the answer to part *b* by the answer to part *c*.

e. Explain why her return is so high.

15. The Delta Corporation has a $20 million bond obligation outstanding, which it is considering refunding. Though the bonds were initially issued at 13 percent, the interest rates on similar issues have declined to 11.5 percent. The bonds were originally issued for 20 years and have 16 years remaining. The new issue would be for 16 years. There is a 9 percent call premium on the old issue. The underwriting cost on the new $20 million issue is $560,000, and the underwriting cost on the old issue was $400,000. The company is in a 40 percent tax bracket, and it will use a 7 percent discount rate (rounded after-tax cost of debt) to analyze the refunding decision. Should the old issue be refunded with new debt? Refunding decision

16. The Sunbelt Corporation has $40 million of bonds outstanding that were issued at a coupon rate of 12⅞ percent seven years ago. Interest rates have fallen to 12 percent. Mr. Heath, the vice-president of finance, does not expect rates to fall any further. The bonds have 18 years left to maturity, and Mr. Heath would like to refund the bonds with a new issue of equal amount also having 18 years to maturity. The Sunbelt Corporation has a tax rate of 36 percent. The underwriting cost on the old issue was *2.5* percent of the total bond value. The underwriting cost on the new issue will be 1.8 percent of the total bond value. The original bond indenture contained a five-year protection against a call, with an 8 percent call premium starting in the sixth year and scheduled to decline by one-half percent each year thereafter (consider the bond to be seven years old for purposes of computing the premium). Assume the discount rate is equal to the aftertax cost of new debt rounded up to the nearest whole number. Should the Sunbelt Corporation refund the old issue? Refunding decision

17. In problem 16, what would be the aftertax cost of the call premium at the end of year 11 (in dollar value)? Call premium

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Capital lease or operating lease

18. The Richmond Corporation has just signed a 144-month lease on an asset with an 18-year life. The minimum lease payments are $3,000 per month ($36,000 per year) and are to be discounted back to the present at an 8 percent annual discount rate. The estimated fair value of the property is $290,000. Should the lease be recorded as a capital lease or an operating lease?

Balance sheet effect of leases

19. The Bradley Corporation has heavy lease commitments. Prior to *SFAS No. 13,* it merely footnoted lease obligations in the balance sheet, which appeared as follows:

BRADLEY CORPORATION
($ millions)

Current assets	$150	Current liabilities	$ 50
Fixed assets	250	Long.term liabilities	100
		Total liabilities	150
		Stockholders' equity	250
Total assets	$400	Total liabilities and stockholders' equity	$400

The footnotes stated that the company had $22 million in annual capital lease obligations for the next 20 years.

a. Discount these annual lease obligations back to the present at a 7 percent discount rate (round to the nearest million dollars).

b. Construct a revised balance sheet that includes lease obligations, as in Table l6–8 on page 484.

c. Compute total debt to total assets on the original and revised balance sheets.

d. Compute total debt to equity on the original and revised balance sheets.

e. In an efficient capital market environment, should the consequences of *SFAS No. 13,* as viewed in the answers to parts *c* and *d,* change stock prices and credit ratings?

f. Comment on management's perception of market efficiency (the viewpoint of the financial officer).

Determining size of lease payments

20. The Lollar Corporation plans to lease an $800,000 asset to the Pierce Corporation. The lease will be for 12 years.

a. If the Lollar Corporation desires a 10 percent return on its investment, how much should the lease payments be?

b. If the Lollar Corporation is able to generate $120,000 in immediate tax shield benefits from the asset to be purchased for the lease arrangement and will pass the benefits along to the Pierce Corporation in the form of lower lease payments, how much should the revised lease payments be? Continue to assume the Lollar Corporation desires a 10 percent return on the 12-year lease.

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S & P PROBLEMS

STANDARD &POOR'S

1. Log on to the McGraw-Hill website www.mhhe.com/edumarketinsight.
2. Click on "Company," which is the first box below the "Market Insight" title.
3. Type American Airlines's ticker symbol (AMR1) in the box and click on Go.
4. Scroll down the left margin and click on "Excel Analytics." At the top of the left margin you will see the second item listed as Annual Balance Sheet.
5. Click on "Ann Balance Sheet" and scroll down to the liabilities section. Over the years covered, what percentage has debt increased from the first year in the report to the most current year?
6. What has happened to the category called "Other debt"?
7. How much have total liabilities increased over the period in dollar terms?
8. Compare total liabilities to total assets. What percentage of total assets is financed by debt?
9. Under the current liabilities section look at the category called "Long-term debt due in one year." What has happened to this number over the years?
10. Without looking at the income statement, determine what has been going on with profitability by examining the retained earnings account and the total equity account.
11. Please repeat the exercise using Southwest Airlines (LUV) and then compare the two companies.

COMPREHENSIVE PROBLEM

Endicott Publishing Co.

(Bond prices, refunding)

Mike Garcia, the chief financial officer of Endicott Publishing Co., could hardly believe the change in interest rates that had taken place over the last few months. The interest rate on A2 rated bonds was now 8 percent. The $30 million, 15-year bond issue that his firm has outstanding was initially issued at 11 percent five years ago.

Because interest rates had gone down so dramatically, he was considering refunding the bond issue. The old issue had a call premium of 10 percent. The underwriting cost on the old issue had been 3 percent of par and on the new issue, it would be 4 percent of par. The tax rate would be 40 percent and a 5 percent discount rate will be applied for the refunding decision. The new bond would have a 10-year life.

Before Mike used the 10 percent call provision to reacquire the old bonds, he wanted to make sure he could not buy them back cheaper in the open market.

a. First compute the price of the old bonds in the open market. Use the valuation procedures for a bond that were discussed in Chapter 10 (use the annual analysis). Determine the price of a single $1,000 par value.

b. Compare the price in part *a* to the 10 percent call premium over par value. Which appears to be more attractive in terms of reacquiring the old bonds?

c. Now do the standard bond refunding analysis as discussed in this chapter. Is the refunding financially feasible?

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d. In terms of the refunding decision, how should Mike be influenced if he thinks interest rates might go down even more?

WEB EXERCISE

Intel was mentioned in the chapter as a firm that was strong enough to issue unsecured debt. Let's look at Intel's financial information.

Go to its website, www.intel.com and follow the steps below:

1. Go to About Intel in the middle of the page and click on "Investor Relations."
2. In the left-hand margin, click on "Financials."
3. Then click on "Annual Reports."
4. Click on the latest annual report.
5. Then in the left-hand margin, click on "Financial Information."
6. To assess Intel's financial strength compute the percentage change over the last 10 years for:
   a. Net revenues
   b. Research and development
   c. Operating income
7. Scroll down and compute the ratio of "long-term debt and put warrants" to stockholders' equity for the last three years.* The average for large U.S. companies is 35 to 50 percent. How does Intel compare?
8. By what percent has Stockholders' equity increased over the last 10 years? By what percent has "Long-term debt and put warrants" increased over the last 10 years?
9. What is your overall impression of Intel based on these numbers?

*Put warrants represent options to sell securities back to the corporation at a specified price. Because they represent a potential obligation of the corporation to buy back securities (whether it wants to or not), they are included with debt.

Note: From time to time, companies redesign their websites and occasionally a topic we have listed may have been deleted, updated, or moved into a different location. Most websites have a "site map" or "site index" listed on a different page. If you click on the site map or site index, you will be introduced to a table of contents which should aid you in finding the topic you are looking for.

Selected References

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APPENDIX 16A

Financial Alternatives for Distressed Firms

A firm may be in financial distress because of **technical insolvency** or bankruptcy. The first term refers to a firm's inability to pay its bills as they come due. Thus, a firm may be technically insolvent, even though it has a positive net worth; there simply may not be sufficient liquid assets to meet current obligations. The second term, **bankruptcy,** indicates the market value of a firm's assets are less than its liabilities and the firm has a negative net worth. Under the law, either technical insolvency or bankruptcy may be adjudged as a financial failure of the business firm.

Many firms do not fall into either category but are still suffering from extreme financial difficulties. Perhaps they are rapidly approaching a situation in which they cannot pay their bills or their net worth will soon be negative.

Firms in the types of financial difficulty discussed in the first two paragraphs may participate in out-of-court settlements or in-court settlements through formal bankruptcy proceedings under the National Bankruptcy Act.

Out-of-court settlements, where possible, allow the firm and its creditors to bypass certain lengthy and expensive legal procedures. If an agreement cannot be reached on a voluntary basis between a firm and its creditors, in-court procedures will be necessary.

Out-of-Court Settlement

Out-of-court settlements may take many forms. Four alternatives will be examined. The first is an **extension,** in which creditors agree to allow the firm more time to meet

its financial obligations. A new repayment schedule will be developed, subject to the acceptance of the creditors.

A second alternative is a **composition,** under which creditors agree to accept a fractional settlement of their original claim. They may be willing to do this because they believe the firm is unable to meet its total obligations and they wish to avoid formal bankruptcy procedures. In the case of either a proposed extension or a composition, some creditors may not agree to go along with the arrangements. If their claims are relatively small, major creditors may allow them to be paid off immediately in full to hold the agreement together. If their claims are large, no out-of-court settlement may be possible, and formal bankruptcy proceedings may be necessary.

A third type of out-of-court settlement may take the form of a **creditor committee** established to run the business. Here the parties involved assume management can no longer effectively conduct the affairs of the firm. Once the creditors' claims have been partially or fully settled, a new management team may be brought in to replace the creditor committee. The outgoing management may be willing to accept the imposition of a creditor committee only when formal bankruptcy proceedings appear likely and they wish to avoid that stigma. Sometimes creditors are unwilling to form such a committee because they fear lawsuits from other dissatisfied creditors or from common or preferred stockholders.

A fourth type of out-of-court settlement is an **assignment,** in which assets are liquidated without going through formal court action. To effect an assignment, creditors must agree on liquidation values and the relative priority of claims. This is not an easy task.

In actuality, there may be combinations of two or more of the above-described out-of-court procedures. For example, there may be an extension as well as a composition, or a creditor committee may help to establish one or more of the alternatives.

In-Court Settlements—Formal Bankruptcy

When it is apparent an out-of-court settlement cannot be reached, the next step is formal bankruptcy. Bankruptcy proceedings may be initiated voluntarily by the company or, alternatively, by creditors.

Once the firm falls under formal bankruptcy proceedings, a referee is appointed by the court to oversee the activities. The referee becomes the arbitrator of the proceedings, whose actions and decisions are final, subject only to review by the court. A trustee will also be selected to properly determine the assets and liabilities of the firm and to carry out a plan of reorganization or liquidation for the firm.

Reorganization If the firm is to be reorganized (under the Bankruptcy Act's Chapter 11 restructuring), the plan must prove to be fair and feasible. An **internal reorganization** calls for an evaluation of current management and operating policies. If current management is shown to be incompetent, it will probably be discharged and replaced by new management. An evaluation and possible redesign of the current capital structure is also necessary. If the firm is top-heavy with debt (as is normally the case), alternate securities, such as preferred or common stock, may replace part of the debt.[1] Any restructuring must be fair to all parties involved.

[1]Another possibility is income bonds, in which interest is payable only if earned.

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An **external reorganization,** in which a merger partner is found for the firm, may also be considered. The surviving firm must be deemed strong enough to carry out the financial and management obligations of the joint entities. Old creditors and stockholders may be asked to make concessions to ensure that a feasible arrangement is established. Their motivation is that they hope to come out further ahead than if such a reorganization were not undertaken. Ideally the firm should be merged with a strong firm in its own industry, although this is not always possible. The savings and loan and banking industries have been particularly adept at merging weaker firms with stronger firms within the industry.

Liquidation A **liquidation** or sale of assets may be recommended when an internal or external reorganization does not appear possible and it is determined that the assets of the firm are worth more in liquidation than through a reorganization. Priority of claims becomes extremely important in a liquidation, because it is unlikely that all parties will be fully satisfied in their demands.

The priority of claims in a bankruptcy liquidation is as follows:

1. Cost of administering the bankruptcy procedures (lawyers get in line first).
2. Wages due workers if earned within three months of filing the bankruptcy petition. The maximum amount is $600 per worker.
3. Taxes due at the federal, state, or local level.
4. Secured creditors to the extent that designated assets are sold to meet their claims. Secured claims that exceed the sales value of the pledged assets are placed in the same category as other general creditor claims.
5. General or unsecured creditors are next in line. Examples of claims in this category are those held by debenture (unsecured bond) holders, trade creditors, and bankers who have made unsecured loans.

   There may be senior and subordinated positions within category 5, indicating that subordinated debt holders must turn over their claims to senior debt holders until complete restitution is made to the higher-ranked category. Subordinated debenture holders may keep the balance if anything is left over after that payment.
6. Preferred stockholders.
7. Common stockholders.

The priority of claims 4 through 7 is similar to that presented in Figure 16–2 on page 470 of the chapter.

Let us examine a typical situation to determine "who" should receive "what" under a liquidation in bankruptcy. Assume the Mitchell Corporation has a book value and liquidation value as shown in Table 16A–1 on page 498. Liabilities and stockholders' claims are also presented.

We see that the liquidation value of the assets is far less than the book value ($700,000 versus $1.3 million). Also, the liquidation value of the assets will not cover the total value of liabilities ($700,000 compared to $1.1 million). Since all liability claims will not be met, it is evident that lower-ranked preferred stockholders and common stockholders will receive nothing.

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Table 16A–1
Financial data for the Mitchell Corporation

Assets	Book Value	Liquidation Value
Accounts receivable	$ 200,000	$160,000
Inventory	410,000	240,000
Machinery and equipment	240,000	100,000
Building and plant	450,000	200,000
	$1,300,000	$700,000
Liabilities and Stockholders' Claims		
Liabilities:		
Accounts payable	$ 300,000	
First lien, secured by machinery and equipment*	200,000	
Senior unsecured debt	400,000	
Subordinated debentures	200,000	
Total liabilities	1,100,000	
Stockholders' claims:		
Preferred stock	50,000	
Common stock	150,000	
Total stockholders' claims	200,000	
Total liabilities and stockholders' claims	$1,300,000	

*A lien represents a potential claim against property. The lien holder has a secured interest in the property.

Before a specific allocation is made to the creditors (those with liability claims), the three highest priority levels in bankruptcy must first be covered. That would include the cost of administering the proceedings, allowable past wages due to workers, and overdue taxes. For the Mitchell Corporation, we shall assume these total $100,000. Since the liquidation value of assets was $700,000, that would leave $600,000 to cover creditor demands, as indicated in the left-hand column of Table 16A–2.

Table 16A–2
Asset values and claims

Assets		Creditor Claims	
Asset values in liquidation	$700,000	Accounts payable	$ 300,000
Administrative costs, wages, and taxes	−100,000	First lien, secured by machinery and equipment	200,000
Remaining asset values	$600,000	Senior unsecured debt	400,000
		Subordinated debentures	200,000
		Total liabilities	$1,100,000

Before we attempt to allocate the values in the left-hand column of Table 16A–2 to the right-hand column, we must first identify any creditor claims that are secured by

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the pledge of a specific asset. In the present case, there is a first lien on the machinery and equipment of $200,000. Referring back to Table 16A–1, we observe that the machinery and equipment has a liquidation value of only $100,000. The secured debt holders will receive $100,000, with the balance of their claim placed in the same category as the unsecured debt holders. In Table 16A–3, we show asset values available for unsatisfied secured claims and unsecured debt (top portion) and the extent of the remaining claims (bottom portion).

Table 16A–3
Asset values available for unsatisfied secured claims and unsecured debt holders—and their remaining claims

Asset values:	
Asset values in liquidation	$ 700,000
Administrative costs, wages, and taxes	100,000
Remaining asset values	600,000
Payment to secured creditors	−100,000
Amount available to unsatisfied secured claims and unsecured debt	$ 500,000
Remaining claims of unsatisfied secured debt and unsecured debt:	
Secured debt (unsatisfied first lien)	$ 100,000
Accounts payable	300,000
Senior unsecured debt	400,000
Subordinated debentures	200,000
	$1,000,000

In comparing the available asset values and claims in Table 16A–3, it appears that the settlement on the remaining claims should be at a 50 percent rate ($500,000/$1,000,000). The allocation will take place in the manner presented in Table 16A–4.

Table 16A–4
Allocation procedures for unsatisfied secured claims and unsecured debt

(1) Category	(2) Amount of Claim	(3) Initial Allocation (50%)	(4) Amount Received
Secured debt (unsatisfied 1st lien)	$ 100,000	$ 50,000	$ 50,000
Accounts payable	300,000	150,000	150,000
Senior unsecured debt	400,000	200,000	300,000
Subordinated debentures	200,000	100,000	0
	$1,000,000	$500,000	$500,000

Each category receives 50 percent as an initial allocation. However, the subordinated debenture holders must transfer their $100,000 initial allocation to the senior debt holders in recognition of their preferential position. The secured debt holders and those having accounts payable claims are not part of the senior-subordinated arrangement and, thus, hold their initial allocation position.

Finally, in Table 16A–5, we show the total amounts of claims, the amount received, and the percent of the claim that was satisfied.

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Table 16A–5
Payments and percent of claims

(1) Category	(2) Total Amount of Claim	(3) Amount Received	(4) Percent of Claim
Secured debt (1st lien)	$200,000	$150,000	75%
Accounts payable	300,000	150,000	50
Senior unsecured debt	400,000	300,000	75
Subordinated debentures	200,000	0	0

The $150,000 in column (3) for secured debt represents the $100,000 from the sale of machinery and equipment, and $50,000 from the allocation process in Table 16A–4. The secured debt holders and senior unsecured debt holders come out on top in terms of percent of claim satisfied (it is coincidental that they are equal). Furthermore, the subordinated debt holders and, as previously mentioned, the preferred and common stockholders receive nothing. Naturally, allocations in bankruptcy will vary from circumstance to circumstance. Working problem 16A–1 will help to reinforce many of the liquidation procedure concepts discussed in this section.

List of Terms

technical insolvency 495
bankruptcy 495
extension 495
composition 496
creditor committee 496
assignment 496
internal reorganization 496
external reorganization 497
liquidation 497

Discussion Questions

16A–1. What is the difference between technical insolvency and bankruptcy?

16A–2. What are four types of out-of-court settlements? Briefly describe each.

16A–3. What is the difference between an internal reorganization and an external reorganization under formal bankruptcy procedures?

16A–4. What are the first three priority items under liquidation in bankruptcy?

Problem

Settlement of claims in bankruptcy liquidation

16A–1. The trustee in the bankruptcy settlement for Immobile Corporation lists the book values and liquidation values for the assets of the corporation. Also, liabilities and stockholders' claims are shown.

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	Book Value	Liquidation Value
Assets		
Accounts receivable	$1,000,000	$ 700,000
Inventory	1,100,000	600,000
Machinery and equipment	800,000	400,000
Building and plant	3,000,000	1,800,000
	$5,900,000	$3,500,000
Liabilities and Stockholders' Claims		
Liabilities:		
Accounts payable	$2,000,000	
First lien, secured by machinery and equipment	650,000	
Senior unsecured debt	1,300,000	
Subordinated debenture	1,450,000	
Total liabilities	5,400,000	
Stockholders' claims:		
Preferred stock	100,000	
Common stock	400,000	
Total stockholders' claims	500,000	
Total liabilities and stockholders' claims	$5,900,000	

a. Compute the difference between the liquidation value of the assets and the liabilities.

b. Based on the answer to part *a,* will preferred stock or common stock participate in the distribution?

c. Assuming the administrative costs of bankruptcy, workers' allowable wages, and unpaid taxes add up to $300,000, what is the total of remaining asset value available to cover secured and unsecured claims?

d. After the machinery and equipment are sold to partially cover the first lien secured claim, how much will be available from the remaining asset liquidation values to cover unsatisfied secured claims and unsecured debt?

e. List the remaining asset claims of unsatisfied secured debt holders and unsecured debt holders in a manner similar to that shown at the bottom portion of Table 16A–3.

f. Compute a ratio of your answers in part *d* and part *e.* This will indicate the initial allocation ratio on page 499.

g. List the remaining claims (unsatisfied secured and unsecured) and make an initial allocation and final allocation similar to that shown in Table 16A–4 on page 499. Subordinated debenture holders may keep the balance after full payment is made to senior debt holders.

h. Show the relationship of amount received to total amount of claim in a similar fashion to that of Table 16A–5 on page 500. (Remember to use the sales [liquidation] value for machinery and equipment plus the allocation amount in part *g* to arrive at the total received on secured debt.)

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APPENDIX 16B

Lease versus Purchase Decision

The classic lease versus purchase decision does not fit a *capital* leasing decision given the existence of *SFAS No. 13* and the similar financial accounting and tax treatment accorded to a capital lease and borrowing to purchase. Nevertheless, the classic lease versus purchase decision is still appropriate for the short-term *operating lease*.

Assume a firm is considering the purchase of a $6,000 asset in the three-year MACRS category (with a four-year write-off) or entering into two sequential operating leases, for two years each. Under the operating leases, the annual payments would be $1,400 on the first lease and $2,600 on the second lease. If a firm purchased the asset, it would pay $1,893 annually to amortize a $6,000 loan over four years at 10 percent interest. This is based on the use of Appendix D for the present value of an annuity.

$$A = \frac{PV_A}{PV_{IFA}} = \frac{\$6{,}000}{3.170} = \$1{,}893 \ (n = 4, i = 10\%)$$

The firm is in a 30 percent tax bracket. In doing our analysis, we look first at the aftertax costs of the operating lease arrangements in Table 16B–1. The tax shield in column (2) indicates the amount the lease payments will save us in taxes. In column (3) we see the net aftertax cost of the lease arrangement.

Table 16B–1
Aftertax cost of operating leases

Year	(1) Payment	(2) Tax Shield 30% of (1)	(3) Aftertax Cost
1	$1,400	$420	$ 980
2	1,400	420	980
3	2,600	780	1,820
4	2,600	780	1,820

For the borrowing and purchasing decision, we must consider not only the amount of the payment but also separate out those items that are tax-deductible. First we consider interest and then depreciation.

In Table 16B–2, we show an amortization table to pay off a $6,000 loan over four years at 10 percent interest with $1,893 annual payments. In column (1) we show the beginning balance for each year. This is followed by the annual payment in column (2). We then show the amount of interest we will pay on the beginning balance at a 10 percent rate in column (3). In column (4) we subtract the interest payment from the annual payment to determine how much is applied directly to the repayment of principal. In column (5) we subtract the repayment of principal from the beginning balance to get the year-end balance.

After determining our interest payment schedule, we look at the depreciation schedule that would apply to the borrow–purchase decision. Using the three-year MACRS depreciation category (with the associated four-year write-off), the asset is depreciated at the rates indicated in Table 16B–3.

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Table 16B–2
Amortization table

Year	(1) Beginning Balance	(2) Annual Payment	(3) Annual Interest 10% of (1)	(4) Repayment of Principal (2) − (3)	(5) Ending Balance (1) − (4)
1	$6,000	$1,893	$600	$1,293	$4,707
2	4,707	1,893	471	1,422	3,285
3	3,285	1,893	329	1,564	1,721
4	1,721	1,893	172	1,721	0

Table 16B–3
Depreciation schedule

Year	Depreciation Base	Depreciation Percentage	Depreciation
1	$6,000	.333	$1,998
2	6,000	.445	2,670
3	6,000	.148	888
4	6,000	.074	444
			$6,000

We now bring our interest and depreciation schedules together in Table 16B–4 to determine the aftertax cost, or cash outflow, associated with the borrow–purchase decision.

Table 16B–4
Aftertax cost of borrow–purchase

Year	(1) Payment	(2) Interest	(3) Depreciation	(4) Total Tax Deductions (2) + (3)	(5) Tax Shield 30% × (4)	(6) Net Aftertax Cost (1) − (5)
1	$1,893	$600	$1,998	$2,598	$779	$1,114
2	1,893	471	2,670	3,141	942	951
3	1,893	329	888	1,217	365	1,528
4	1,893	172	444	616	185	1,708

The interest and depreciation charges are tax-deductible expenses and provide a tax shield against other income. The total deductions in column (4) are multiplied by the tax rate of 30 percent to show the tax shield benefits in column (5). In column (6), we subtract the tax shield from the payments to get the net aftertax cost, or cash outflow.

Finally, we compare the cash outflows from leasing to the cash outflows from borrowing and purchasing. To consider the time value of money, we discount the annual values at an interest rate of 7 percent. This is the aftertax cost of debt to the firm, and it is computed by multiplying the interest rate of 10 percent by (1 − Tax rate). Because the costs associated with both leasing and borrowing are contractual and certain, we use the aftertax cost of debt as the discount rate, rather than the normal cost of capital. The overall analysis is presented in Table 16B–5.

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Table 16B–5
Net present value comparison

Year	Aftertax Cost of Leasing	Present Value Factor at 7%	Present Value	Aftertax Cost of Borrow–Purchase	Present Value Factor at 7%	Present Value
1.....	$ 980	0.935	$ 916	$1,114	0.935	$1,042
2.....	980	0.873	856	951	0.873	830
3.....	1,820	0.816	1,485	1,528	0.816	1,247
4.....	1,820	0.763	1,389	1,708	0.763	1,303
			$4,646			$4,422

The borrow–purchase alternative has a lower present value of aftertax costs ($4,422 versus $4,646), which would appear to make it the more desirable alternative. However, many of the previously discussed qualitative factors that support leasing must also be considered in the decision-making process.

Problem

Lease versus purchase decision

16B-1. Edison Electronics is considering whether to borrow funds and purchase an asset or to lease the asset under an operating lease arrangement. If it purchases the asset, the cost will be $8,000. It can borrow funds for four years at 12 percent interest. The firm will use the three-year MACRS depreciation category (with the associated four-year write-off). Assume a tax rate of 35 percent.

The other alternative is to sign two operating leases, one with payments of $2,100 for the first two years, and the other with payments of $3,700 for the last two years. In your analysis, round all values to the nearest dollar.

a. Compute the aftertax cost of the leases for the four years.

b. Compute the annual payment for the loan (round to the nearest dollar).

c. Compute the amortization schedule for the loan. (Disregard a small difference from a zero balance at the end of the loan due to rounding.)

d. Determine the depreciation schedule (see Table 12–9 in Chapter 12).

e. Compute the aftertax cost of the borrow–purchase alternative.

f. Compute the present value of the aftertax cost of the two alternatives. Use a discount rate of 8 percent.

g. Which alternative should be selected, based on minimizing the present value of aftertax costs?

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