

Chapter 14- Bonds and Long Term Notes

Question 14-1

Periodic interest is calculated as the *effective interest rate times the amount of the debt outstanding during the period*. This same principle applies to the flip side of the transaction, i.e., the creditor's receivable or investment. The approach also is the same regardless of the specific form of the debt – that is, whether in the form of notes, bonds, leases, pensions, or other debt instruments.

Question 14-2

Long-term liabilities are appropriately reported at their *present values*. The present value of a liability is the present value of its related cash flows – specifically the present value of the face amount of the debt instrument, if any, plus the present value of stated interest payments, if any. Both should be discounted to present value at the effective (market) rate of interest at issuance.

Question 14-3

Bonds and notes are very similar. Both typically obligate the issuing corporation to repay a stated amount (e.g., the *principal, par value, face amount, or maturity value*) at a specified *maturity date*. In return for the use of the money borrowed, the company also agrees to pay *interest* to the lender between the issue date and maturity. The periodic interest is a stated percentage of face amount. In concept, bonds and notes are accounted for in precisely the same way.

Normally a company will borrow cash from a bank or other financial institution by signing a promissory note. Corporations, especially medium- and large- sized firms, often choose to borrow cash by issuing bonds, instead. A bond issue, in effect, breaks down a large debt into manageable parts (\$1,000 units). Also, bonds typically have longer maturities than notes. The most common form of corporate debt is bonds.

Question 14-4

All of the specific promises made to bondholders are described in a bond indenture. This formal agreement will specify the bond issue's face amount, the stated interest rate, the method of paying interest (whether the bonds are registered bonds or coupon bonds), whether the bonds are backed by a lien on specified assets, and whether they are subordinated to other debt. The bond indenture also might provide for their redemption through a call feature, by serial payments, through sinking fund provisions, or by conversion. It also will specify the trustee (usually a commercial bank or other financial institution) appointed by the issuing firm to represent the rights of the bondholders. The bond indenture serves as a contract between the company and the bondholder(s). If the company fails to live up to the terms of the bond indenture, the trustee may bring legal action against the company on behalf of the bondholders.

Question 14-5

All bonds sell at their price plus any interest that has accrued since the last interest date to simplify the process of paying and recording interest. The buyer is asked to pay the seller accrued interest for any time that has elapsed since the last interest date in addition to the price of the bonds so that when a full six months' interest is paid at the next interest date, the net interest paid/received will be correct for the time the bonds have been held by the investor.

Question 14-6

In order for Brandon to sell its bonds that pay only 11.5% stated interest in a 12.25% market the bonds would have to be priced at a discount from face amount. The discount would be the amount that causes the bond issue to be *priced to yield the market rate*. In other words, an investor paying that price would earn an effective rate of return on the investment equal to the 12.25% market rate.

Question 14-7

The price will be the present value of the periodic cash *interest* payments (face amount x stated rate) plus the present value of the *principal* payable at maturity. Both interest and principal are discounted to present value at the market rate of interest for securities of similar risk and maturity.

Question 14-8

In a strict sense, it's true that zero-coupon bonds pay no interest. "Zeros" offer a return in the form of a "deep discount" from the face amount. Still, interest accrues at the effective rate times the outstanding balance, but no interest is paid periodically. So, interest on zero-coupon bonds is determined and reported in precisely the same manner as on interest-paying bonds. Under the concept of *accrual accounting*, the periodic effective interest is unaffected by when the cash actually is paid. Corporations can deduct for tax purposes the annual interest expense, but without cash outflow until the bonds mature.

Question 14-9

When bonds are issued at a premium the debt *declines* each period because the effective interest each period is *less than* the cash interest paid. The "overpayments" each period reduce the balance owed. This is precisely the opposite of when debt is sold at a discount. In that case, the effective interest each period is more than the cash paid, and the "underpayment" of interest adds to the amount owed.

Question 14-10

By the **effective interest method**, interest is recorded each period as the *effective market rate of interest multiplied by the outstanding balance of the debt* (during the interest period). This simply is an application of the accrual concept, consistent with accruing all expenses as they are incurred. The "unpaid" (or "overpaid") portion of the effective interest increases (or decreases) the existing liability and is reflected as "amortization" of the discount (or premium).

An exception to the conceptually appropriate method of determining interest for bond issues is the **straight-line method**. Companies are allowed to determine interest indirectly by allocating a discount or a premium *equally* to each period over the term to maturity if doing so produces results that are not materially different from the interest method. The firm's decision should be guided by whether the straight-line method would tend to mislead investors and creditors in the particular circumstance.

The straight-line method results in a *constant dollar amount* of interest each period. By the straight-line method, the amount of the discount to be reduced periodically is calculated, and the effective interest is the "plug" figure. By the effective interest method, the dollar amounts of interest vary over the term to maturity because the *percentage rate* of interest remains constant, but is applied to a changing debt balance. The "straight-line method," is not an alternative method of determining interest in a conceptual sense, but is an application of the *materiality concept*.

Question 14-11

The prescribed treatment requires a debit to an asset account – "debt issue costs" which is then allocated to expense, usually on a straight-line basis. An appealing alternative would be to reduce the recorded amount of the debt by the debt issue costs. This approach has the appeal of reflecting the effect debt issue costs have on the effective interest rate.

Debt issue costs reduce the net cash the company receives from the sale of the financial instrument. A lower net amount is borrowed at the same cost, increasing the effective interest rate. The actual increase in the effective interest rate is reflected in the interest expense if the issue cost is allowed to reduce the premium (or increase the discount) on the debt.

This approach also is consistent with the treatment of issue costs when shares of stock are sold. Share issue costs are recorded as a reduction in the amount credited to stock accounts (Chapter 19).

Question 14-12

When the *stated* interest rate is not indicative of the *market* rate at the time a note is negotiated, the value of the asset (cash or noncash) or service exchanged for the note establishes the market rate. This rate is the *implicit rate of interest*.

If the value of the asset (or service) is not readily determinable, the implicit rate may not be apparent. In that case an appropriate rate should be "imputed" as the rate that would be expected in a similar transaction, under similar circumstances.

The economic essence of a transaction should prevail over its outward appearance. The accountant should look beyond the *form* of this transaction and record its *substance*. The amount actually paid for the asset is the present value of the cash flows called for by the loan agreement, discounted at the "imputed" market rate. Both the asset acquired and the liability used to purchase it should be recorded at the *real* cost.

Question 14-13

When notes are paid in installments, rather than a single amount at maturity, installment payments typically are equal amounts each period. Each payment will include both an amount representing interest and an amount representing a reduction of principal. At maturity, the principal is completely paid. The installment amount is calculated by dividing the amount of the loan by the appropriate discount factor for the present value of an annuity.

Determining periodic interest is the same as for a note whose principal is paid at maturity – effective interest rate times the outstanding principal. But the periodic cash payments are larger and there is no lump-sum payment at maturity.

Question 14-14

For all long-term borrowings, disclosure should include (a) the fair values, (b) the aggregate amounts maturing, and (c) sinking fund requirements (if any) for *each of the next five years*.

Question 14-15

Regardless of the method used to retire debt prior to its scheduled maturity date, the gain or loss on the transaction is simply the difference between the carrying amount of the debt at that time and the cash paid to retire it. To record the extinguishment the account balances pertinent to the debt are removed from the books. Cash is credited for the amount paid (the call price or market price). The difference between the carrying amount and the reacquisition price is the gain or loss.

Question 14-16

Gains and losses are reported as extraordinary items when they are considered to be both unusual and infrequent. In that case they are reported separate from ordinary operations and net of their related income tax effects.

Question 14-17

GAAP requires that the entire issue price of convertible bonds be recorded as debt, precisely the same way, in fact, as for nonconvertible bonds. On the other hand, the issue price of bonds with detachable warrants is allocated between the two different securities on the basis of their market values.

The difference is based on the relative separability of the debt and equity features of the two securities. In the case of convertible bonds, the two features of the security, the debt and the conversion option, are physically inseparable — the option cannot be exercised without surrendering the debt. But the debt and equity features of bonds with detachable warrants *can* be separated. Unlike a conversion feature, warrants can be separated from the bonds and can be exercised independently or traded in the market separately from bonds. In substance, two different securities — the bonds and the warrants — are sold as a "package" for a single issue price.

Question 14-18

Additional consideration a company provides to induce conversion of convertible debt should be recorded as an expense of the period. It is measured at the fair value of that consideration. This might be cash paid, the market price of stock warrants given, or the market value of additional shares issued due to modifying the conversion ratio.

Question 14-19

By definition, a troubled debt restructuring involves some *concessions* on the part of the creditor (lender). A creditor may feel it can minimize losses by *restructuring* a debt agreement, rather than forcing liquidation. A troubled debt restructuring takes one of two forms, with the second further categorized for accounting purposes:

1. The debt may be *settled* at the time of the restructuring, or
2. The debt may be *continued*, but with *modified terms*.
 - a. Under the modified terms, total cash to be paid *is less than* the carrying amount of the debt.
 - b. Under the modified terms, total cash to be paid *exceeds* the carrying amount of the debt.

Question 14-20

Pratt has a *gain* of \$2 million (the difference between the carrying amount of the debt and the fair value of the property transferred). Pratt also must adjust the carrying amount of the land to its fair value prior to recording its exchange for the debt. Pratt would need to change the recorded amount for the property specified in the exchange agreement from \$2 million to the \$3 million fair market value. This produces a "gain on disposition of assets" of \$1 million. So, Pratt would report two items on its income statement in connection with the troubled debt restructuring: (1) a \$2 million gain on troubled debt restructuring and (2) a "gain on disposition of assets" of \$1 million.

Question 14-21

(a) When the total future cash payments are less than the carrying amount of the debt, the difference is recorded as a *gain* to the *debtor* at the date of restructure. *No interest* is recorded thereafter. All subsequent cash payments produce reductions of principal.

- (b) When the total future cash payments exceed the carrying amount of the debt, no reduction of the existing debt is necessary and no entry is required at the time of the debt restructuring. The accounting objective is to determine the new (lower) effective interest and to record interest expense for the remaining term of the loan at that new, lower rate.

Exercise 14-3

1. Maturity	Interest paid	Stated rate	Effective (market) rate
10 years	annually	10%	12%
Interest	\$100,000 ¥	x	5.65022 * = \$565,022
Principal	\$1,000,000	x	0.32197 ** = <u>321,970</u>
<i>Present value (price) of the bonds</i>			\$886,992

¥ 10% x \$1,000,000

* present value of an ordinary annuity of \$1: n=10, i=12%

** present value of \$1: n=10, i=12%

2. Maturity	Interest paid	Stated rate	Effective (market) rate
10 years	semiannually	10%	12%
Interest	\$50,000 ¥	x	11.46992 * = \$573,496
Principal	\$1,000,000	x	0.31180 ** = <u>311,800</u>
<i>Present value (price) of the bonds</i>			\$885,296

¥ 5% x \$1,000,000

* present value of an ordinary annuity of \$1: n=20, i=6%

** present value of \$1: n=20, i=6%

3. Maturity	Interest paid	Stated rate	Effective (market) rate
10 years	semiannually	12%	10%
Interest	\$60,000 ¥	x	12.46221 * = \$ 747,733
Principal	\$1,000,000	x	0.37689 ** = <u>376,890</u>
<i>Present value (price) of the bonds</i>			\$1,124,623

¥ 6% x \$1,000,000

* present value of an ordinary annuity of \$1: n=20, i=5%

** present value of \$1: n=20, i=5%

4. Maturity	Interest paid	Stated rate	Effective (market) rate
20 years	semiannually	12%	10%
Interest	\$60,000 ¥	x	17.15909 * = \$1,029,545
Principal	\$1,000,000	x	0.14205 ** = <u>142,050</u>
<i>Present value (price) of the bonds</i>			\$1,171,595

¥ 6% x \$1,000,000

* present value of an ordinary annuity of \$1: n=40, i=5%

** present value of \$1: n=40, i=5%

5. Maturity	Interest paid	Stated rate	Effective (market) rate
20 years	semiannually	12%	12%
Interest	\$60,000 ¥	x	15.04630 * = \$902,778
Principal	\$1,000,000	x	0.09722 ** = <u>97,220</u>
<i>Present value (price) of the bonds</i>			\$999,998

actually, **\$1,000,000** if PV table factors were not rounded

¥ 6% x \$1,000,000

* present value of an ordinary annuity of \$1: n=40, i=6%

** present value of \$1: n=40, i=6%

Exercise 14-4

1. Price of the bonds at January 1, 2003

Interest	\$4,000,000 ¥	x	11.46992 * = \$45,879,680
Principal	\$80,000,000	x	0.31180 ** = <u>24,944,000</u>
<i>Present value (price) of the bonds</i>			\$70,823,680

¥ 5% x \$80,000,000

* present value of an ordinary annuity of \$1: n=20, i=6%

** present value of \$1: n=20, i=6%

2. January 1, 2003

Cash (price determined above)	70,823,680	
Discount on bonds (difference).....	9,176,320	
Bonds payable (face amount)		80,000,000

3. June 30, 2003

Interest expense (6% x \$70,823,680).....	4,249,421	
Discount on bonds payable (difference).....		249,421
Cash (5% x \$80,000,000)		4,000,000

4. December 31, 2003

Interest expense (6% x [\$70,823,680 + 249,421]).....	4,264,386	
Discount on bonds payable (difference).....		264,386
Cash (5% x \$80,000,000)		4,000,000

Exercise 14-6

1. Price of the bonds at January 1, 2003

Interest	\$16,000,000 [¥]	x	11.46992 [*]	=	\$183,518,720
Principal	\$320,000,000	x	0.31180 ^{**}	=	<u>99,776,000</u>
<i>Present value (price) of the bonds</i>					\$283,294,720

¥ 5% x \$320,000,000

* present value of an ordinary annuity of \$1: n=20, i=6%

** present value of \$1: n=20, i=6%

2. Liability at December 31, 2003

Bonds payable (face amount).....	\$320,000,000
Less: discount	<u>36,705,280</u>
Initial balance, January 1, 2003	\$283,294,720
June 30, 2003 discount amortization	997,683*
Dec. 31, 2003 discount amortization	<u>1,057,544**</u>
December 31, 2003 net liability.....	\$285,349,947

3. Interest expense for year ended December 31, 2003

June 30, 2003 interest expense	\$16,997,683*
Dec. 31, 2003 interest expense	<u>17,057,544**</u>
Interest expense for 2003	\$34,055,227

4. Statement of cash flows for year ended December 31, 2003

Myriad would report the cash inflow of \$283,294,720*** from the sale of the bonds as a cash flow from financing activities in its statement of cash flows.

The \$32,000,000 cash interest paid *, ** is cash outflow from operating activities because interest is an income statement (operating) item.

Calculations:

January 1, 2003***

Cash (price determined above)	283,294,720	
Discount on bonds (difference).....	36,705,280	
Bonds payable (face amount)		320,000,000

June 30, 2003*

Interest expense (6% x \$283,294,720).....	16,997,683	
Discount on bonds payable (difference).....		997,683
Cash (5% x \$320,000,000)		16,000,000

December 31, 2003**

Interest expense (6% x [\$283,294,720 + 997,683]).....	17,057,544	
Discount on bonds payable (difference).....		1,057,544
Cash (5% x \$320,000,000).....		16,000,000

Exercise 14-8

1. Price of the bonds at January 1, 2003

Interest	\$7,500,000 [¥]	x	13.76483 [*]	=	\$103,236,225
Principal	\$150,000,000	x	0.17411 ^{**}	=	<u>26,116,500</u>

Present value (price) of the bonds \$129,352,725

[¥] 5% x \$150,000,000

^{*} present value of an ordinary annuity of \$1: n=30, i=6%

^{**} present value of \$1: n=30, i=6%

2. January 1, 2003

Cash (price determined above).....	129,352,725	
Discount on bonds (difference).....	20,647,275	
Bonds payable (face amount).....		150,000,000

3. June 30, 2003

Interest expense (\$7,500,000 + \$688,243).....	8,188,243	
Discount on bonds payable (\$20,647,275 ÷ 30).....		688,243
Cash (5% x \$150,000,000).....		7,500,000

4. December 31, 2010

Interest expense (\$7,500,000 + \$688,243).....	8,188,243	
Discount on bonds payable (\$20,647,275 ÷ 30).....		688,243
Cash (5% x \$150,000,000).....		7,500,000

[Using the straight-line method, each interest entry is the same.]

Exercise 14-16

1. January 1, 2003

Operational assets	4,000,000	
Notes payable		4,000,000

2. Amortization schedule

\$4,000,000	÷	3.16987	=	\$1,261,881
amount		(from Table 6A-4)		installment
of loan		n=4, i=10%		payment

Dec.31	Cash Payment	Effective Interest 10% x Outstanding Balance	Decrease in Balance Balance Reduction	Outstanding Balance
			4,000,000	
2003	1,261,881	.10 (4,000,000) = 400,000	861,881	3,138,119
2004	1,261,881	.10 (3,138,119) = 313,812	948,069	2,190,050
2005	1,261,881	.10 (2,190,050) = 219,005	1,042,876	1,147,174
2006	<u>1,261,881</u>	.10 (1,147,174) = <u>114,707*</u>	<u>1,147,174</u>	0
	5,047,524		1,047,524	4,000,000
	* rounded.			

3. December 31, 2003

Interest expense (10% x outstanding balance).....	400,000	
Note payable (difference)	861,881	
Cash (payment determined above)		1,261,881

4. December 31, 2005

Interest expense (10% x outstanding balance).....	219,005	
Note payable (difference)	1,042,876	
Cash (payment determined above)		1,261,881

Exercise 14-17

Bonds payable (face amount).....	90,000,000	
Loss on early extinguishment (to balance)	4,800,000	
Discount on bonds (given).....		3,000,000
Cash (\$90,000,000 x 102%)		91,800,000

Exercise 14-18

Requirement 1

Gless (Issuer)

Cash (101% x \$12 million).....	12,120,000	
Convertible bonds payable (face amount)		12,000,000
Premium on bonds payable (difference).....		120,000

Century (Investor)

Investment in convertible bonds (10% x \$12 million)	1,200,000	
Premium on bond investment (difference)	12,000	
Cash (101% x \$1.2 million).....		1,212,000

Requirement 2

Gless (Issuer)

Interest expense (\$540,000 - \$6,000).....	534,000	
Premium on bonds payable (\$120,000 ÷ 20).....	6,000	
Cash (4.5% x \$12,000,000).....		540,000

Century (Investor)

Cash (4.5% x \$1,200,000).....	54,000	
Premium on bond investment (\$12,000 ÷ 20).....		600
Interest revenue (\$54,000 - \$600).....		53,400

[Using the straight-line method, each interest entry is the same.]

Requirement 3

Gless (Issuer)

Convertible bonds payable (10% of the account balance).....	1,200,000	
Premium on bonds payable		
(((\$120,000 - [\$6,000 x 11]) x 10%).....	5,400	
Common stock ([1,200 x 40 shares] x \$1 par).....		48,000
Paid-in capital – excess of par (to balance).....		1,157,400

Century (Investor)

Investment in common stock.....	1,205,400	
Investment in convertible bonds (account balance).....		1,200,000
Premium on bond investment (\$12,000 - [\$600 x 11]).....	5,400	

Exercise 14-19

Requirement 1

(\$ in millions)

Limbaugh (Issuer)

Cash (104% x \$30 million).....	31.2	
Discount on bonds payable (difference).....	3.6	
Bonds payable (face amount).....		30.0
Paid-in capital – stock warrants outstanding		
(\$8 x 20 warrants x [\$30,000,000 ÷ \$1,000] bonds).....		4.8

Interstate (Investor)

Investment in stock warrants (\$4.8 million x 20%).....	0.96	
Investment in bonds (20% x \$30 million).....	6.00	
Discount on bonds (difference).....		0.72
Cash (104% x \$30 million x 20%).....		6.24

Requirement 2

(\$ in millions)

Limbaugh (Issuer)

Cash (20% x 30,000 bonds x 20 warrants x \$60)	7.20	
Paid-in capital – stock warrants outstanding (\$4.8 million x 20%).....	0.96	
Common stock (20% x 30,000 x 20 shares x \$10 par).....		1.20
Paid-in capital – excess of par (to balance).....		6.96

Interstate (Investor)

Investment in common stock (to balance)	8.16	
Investment in stock warrants (\$4.8 million x 20%)96
Cash (20% x 30,000 x 20 warrants x \$60)		7.20

Problem 14-5

Requirement 1

Interest	\$3,600,000 [¥]	x	6.46321 [*]	=	\$23,267,556
Principal	\$80,000,000	x	0.67684 ^{**}	=	<u>54,147,200</u>

Present value (price) of the bonds \$77,414,756

[¥] 4.5% x \$80,000,000

^{*} present value of an ordinary annuity of \$1: n=8, i=5%

^{**} present value of \$1: n=8, i=5%

Requirement 2

(a) Cromley

	Cash Interest 4.5% x Face Amount	Effective Interest 5% x Outstanding Balance	Increase in Balance Discount Reduction	Outstanding Balance
				77,414,756
1	3,600,000	.05 (77,414,756) = 3,870,738	270,738	77,685,494
2	3,600,000	.05 (77,685,494) = 3,884,275	284,275	77,969,769
3	3,600,000	.05 (77,969,769) = 3,898,488	298,488	78,268,257
4	3,600,000	.05 (78,268,257) = 3,913,413	313,413	78,581,670
5	3,600,000	.05 (78,581,670) = 3,929,084	329,084	78,910,754
6	3,600,000	.05 (78,910,754) = 3,945,538	345,538	79,256,292
7	3,600,000	.05 (79,256,292) = 3,962,815	362,815	79,619,107
8	<u>3,600,000</u>	.05 (79,619,107) = <u>3,980,893*</u>	<u>380,893</u>	80,000,000
	28,800,000		31,385,244	2,585,244

* rounded.

(b) Barnwell

	Cash Interest 4.5% x Face Amount	Effective Interest 5% x Outstanding Balance	Increase in Balance Discount Reduction	Outstanding Balance
				77,415
1	3,600	.05 (77,415) = 3,871	271	77,686
2	3,600	.05 (77,686) = 3,884	284	77,970
3	3,600	.05 (77,970) = 3,899	299	78,269
4	3,600	.05 (78,269) = 3,913	313	78,582
5	3,600	.05 (78,582) = 3,929	329	78,911
6	3,600	.05 (78,911) = 3,946	346	79,257
7	3,600	.05 (79,257) = 3,963	363	79,620
8	<u>3,600</u>	.05 (79,620) = <u>3,980</u> *	<u>380</u>	80,000
	28,800	31,385	2,585	

*rounded

Requirement 3

February 1, 2003 (Cromley)

Cash (price determined above)	77,414,756	
Discount on bonds (difference).....	2,585,244	
Bonds payable (face amount)		80,000,000

February 1, 2003 (Barnwell)

Bond investment (face amount)	80,000	
Discount on bond investment (difference)		2,585
Cash (price paid).....		77,415

Problem 14-5 (continued)

Requirement 4

July 31, 2003 (Cromley)

Interest expense (from schedule)	3,870,738	
Discount on bonds payable (from schedule)		270,738
Cash (from schedule)		3,600,000

July 31, 2003 (Barnwell)

Cash (from schedule)	3,600	
Discount on investment (from schedule)	271	
Interest revenue (from schedule)		3,871

December 31, 2003 (Cromley)

Interest expense ($\frac{5}{6} \times \$3,884,275$).....	3,236,896	
Discount on bonds payable ($\frac{5}{6} \times \$284,275$).....		236,896
Interest payable ($\frac{5}{6} \times \$3,600,000$).....		3,000,000
December 31, 2003 (Barnwell)		
Interest receivable ($\frac{5}{6} \times \$3,600$).....	3,000	
Discount on investment ($\frac{5}{6} \times \$284$).....	237	
Interest revenue ($\frac{5}{6} \times \$3,884$).....		3,237
January 31, 2004 (Cromley)		
Interest expense ($\frac{1}{6} \times \$3,884,275$).....	647,379	
Interest payable (from adjusting entry above).....	3,000,000	
Discount on bonds payable ($\frac{1}{6} \times \$284,275$).....		47,379
Cash (stated rate x face amount).....		3,600,000
January 31, 2004 (Barnwell)		
Cash (stated rate x face amount).....	3,600	
Discount on bond investment ($\frac{1}{6} \times \$284$).....	47	
Interest receivable (from adjusting entry above).....		3,000
Interest revenue ($\frac{1}{6} \times \$3,884$).....		647
July 31, 2004 (Cromley)		
Interest expense (from schedule).....	3,898,488	
Discount on bonds payable (from schedule).....		298,488
Cash (from schedule).....		3,600,000
July 31, 2004 (Barnwell)		
Cash (from schedule).....	3,600	
Discount on investment (from schedule).....	299	
Interest revenue (from schedule).....		3,899
December 31, 2004 (Cromley)		
Interest expense ($\frac{5}{6} \times \$3,913,413$).....	3,261,177	
Discount on bonds payable ($\frac{5}{6} \times \$313,413$).....		261,177
Interest payable ($\frac{5}{6} \times \$3,600,000$).....		3,000,000

December 31, 2004 (Barnwell)

Interest receivable ($\frac{5}{6} \times \$3,600$)	3,000	
Discount on investment ($\frac{5}{6} \times \$313$).....	261	
Interest revenue ($\frac{5}{6} \times \$3,913$).....		3,261

January 31, 2005 (Cromley)

Interest expense ($\frac{1}{6} \times \$3,913,413$).....	652,236*	
Interest payable (from adjusting entry above)	3,000,000	
Discount on bonds payable ($\frac{1}{6} \times \$313,413$).....		52,236*
Cash (stated rate x face amount)		3,600,000

January 31, 2005 (Barnwell)

Cash (stated rate x face amount).....	3,600	
Discount on bond investment ($\frac{1}{6} \times \$313$).....	52	
Interest receivable (from adjusting entry above).....		3,000
Interest revenue ($\frac{1}{6} \times \$3,913$).....		652

*rounded

Problem 14-17

List A

List B

- | | |
|---|--|
| <u>j</u> 1. Effective rate times balance | a. Straight-line method |
| <u>h</u> 2. Promises made to bondholders | b. Discount |
| <u>o</u> 3. Present value of interest plus present value of principal | c. Liquidation payments after other claims satisfied |
| <u>m</u> 4. Call feature | d. Name of owner not registered |
| <u>l</u> 5. Debt issue costs | e. Premium |
| <u>b</u> 6. Market rate higher than stated rate | f. Checks are mailed directly |
| <u>d</u> 7. Coupon bonds | g. No specific assets pledged |
| <u>k</u> 8. Convertible bonds | h. Bond indenture |
| <u>e</u> 9. Market rate less than stated rate | i. Backed by a lien |
| <u>n</u> 10. Stated rate times face amount | j. Interest expense |
| <u>f</u> 11. Registered bonds | k. May become stock |
| <u>g</u> 12. Debenture bond | l. Legal, accounting, printing |
| <u>i</u> 13. Mortgage bond | m. Protection against falling rates |
| <u>a</u> 14. Materiality concept | n. Periodic cash payments |
| <u>c</u> 15. Subordinated debenture | o. Bond price |

Problem 14-18

Requirement 1

Bonds payable (face amount)	20,000,000	
Premium on bonds ($\frac{20}{40} \times \$6,000,000$)	3,000,000	
Gain on early extinguishment (to balance).....		2,600,000
Cash ($\$20,000,000 \times 102\%$)		20,400,000

Requirement 2

Bonds payable (face amount)	10,000,000	
Premium on bonds ($10/40 \times \$6,000,000$)	1,500,000	
Gain on early extinguishment (to balance)		1,000,000
Cash (given)		10,500,000

Problem 14-19

Requirement 1

		(\$ in millions)
Convertible Bonds – 1990 issue		
Cash ($97.5\% \times \$200$ million)	195	
Discount on bonds (difference)	5	
Convertible bonds payable (face amount)		200
Bonds With Warrants – 1994 issue		
Cash ($102\% \times \$50$ million)	51	
Discount on bonds payable (difference)	3	
Bonds payable (face amount)		50
Paid-in capital – stock warrants outstanding (given)		4

Requirement 2

		(\$ in millions)
Convertible bonds payable ($90\% \times \$200$ million)	180	
Discount on bonds payable ($90\% \times \$2$ million)		1.8
Common stock ($90\% \times [200,000 \times 40 \text{ shares}] \times \1 par)		7.2
Paid-in capital – excess of par (to balance)		171.0
Convertible bonds payable ($10\% \times \$200$ million)	20.0	
Loss on early extinguishment (to balance)4	
Discount on bonds payable ($10\% \times \$2$ million)2
Cash ($101\% \times 10\% \times \200 million)		20.2

Requirement 3

		(\$ in millions)
Convertible bonds payable ($90\% \times \$200$ million)	180	
Conversion expense ($90\% \times 200,000 \text{ bonds} \times \150)	27	
Discount on bonds payable ($90\% \times \$2$ million)		1.8
Common stock ($90\% \times [200,000 \times 40 \text{ shares}] \times \1 par)		7.2
Paid-in capital – excess of par (to balance)		171.0
Cash ($90\% \times 200,000 \text{ bonds} \times \150)		27.0

Problem 14-19 (concluded)

Requirement 4

	(\$ in millions)
Convertible bonds payable (90% x \$200 million).....	180.0
Conversion expense	
(90% x [200,000 x (45 – 40) shares] x \$32).....	28.8
Discount on bonds payable (90% x \$2 million).....	1.8
Common stock (90% x [200,000 x 45 shares] x \$1 par).....	8.1
Paid-in capital – excess of par (to balance).....	198.9

Requirement 5

	(\$ in millions)
Cash (40% x 50,000 x 40 warrants x \$25).....	20.0
Paid-in capital – stock warrants outstanding (40% x \$4 million).....	1.6
Common stock (40% x 50,000 x 40 shares x \$1 par).....	.8
Paid-in capital – excess of par (to balance).....	20.8

Problem 14-20

Requirement 1

	(\$ in millions)
Land.....	3
Gain on disposal	3
Note payable.....	20
Accrued interest payable	2
Land	16
Gain on debt restructuring	6

Requirement 2

Analysis: Carrying amount:	\$20 million + \$2 million =	\$22,000,000
Future payments:	(\$1 million x 4) + \$15 million =	<u>19,000,000</u>
Gain to debtor		\$ 3,000,000

(a) January 1, 2003

	(\$ in millions)
Accrued interest payable	2
Note payable *.....	1
Gain on debt restructuring	3

* establishes a balance in the note account equal to the total cash payments under the new agreement (\$20 million – 1 million = \$19 million)

(b) December 31, 2003, 2004, 2005, and 2006 revised “interest” payments

Note payable	1	
Cash		1

Note: No interest expense should be recorded after the restructuring. All subsequent cash payments result in reductions of principal.

(c) December 31, 2006 revised principal payment

Note payable	15	
Cash		15

Requirement 3

Analysis:	<i>Carrying amount:</i>	$\$20,000,000 + \$2,000,000 =$	$\$22,000,000$
	<i>Future payments:</i>		<u>$27,775,000$</u>
	Interest		$\$ 5,775,000$

Calculation of the new effective interest rate:

- $\$22,000,000 \div \$27,775,000 = .79208$ – the Table 6A-2 value for $n = 4, i = ?$
- In row 4 of Table 6A-2, the number .79209 is in the 6% column. So, this is the **new** effective interest rate.

(a) January 1, 2003

[Since the total future cash payments are not less than the carrying amount of the debt, no reduction of the existing debt is necessary and no entry is required at the time of the debt restructuring.]

Amortization Schedule (not required)

Dec.31	Cash Interest	Effective Interest 6% x Outstanding Balance	Increase in Balance	Outstanding Balance
				22,000,000
2003	0	.06 (22,000,000) = 1,320,000	1,320,000	23,320,000
2004	0	.06 (23,320,000) = 1,399,200	1,399,200	24,719,200
2005	0	.06 (24,719,200) = 1,483,152	1,483,152	26,202,352
2006	<u>0</u>	.06 (26,202,352) = <u>1,572,648*</u>	<u>1,572,648</u>	27,775,000
	0	5,775,000	5,775,000	

* rounded

Problem 14-20 (concluded)

(b) December 31, 2003

Interest expense	1,320,000	
Interest payable		1,320,000

December 31, 2004

Interest expense	1,399,200	
Interest payable		1,399,200

December 31, 2005

Interest expense	1,483,152	
Interest payable		1,483,152

December 31, 2006

Interest expense	1,572,648	
Interest payable		1,572,648

(c) December 31, 2006 revised payment

Interest payable.....	7,775,000	
Note payable.....	20,000,000	
Cash.....		27,775,000

CASES

Judgment Case 14-10

Requirement 1

The debt to equity ratio is computed by dividing total liabilities by total shareholders' equity. The ratio summarizes the capital structure of the company as a mix between the resources provided by creditors and those provided by owners. For example, a ratio of 2.0 means that twice as many resources (assets) have been provided by creditors as those provided by owners.

$$\begin{aligned}
 \text{Debt to equity ratio} &= \frac{\text{Total liabilities}}{\text{Shareholders' equity}} \\
 &= \frac{\$2,414}{\$2,931} \\
 &= \underline{\underline{0.82}}
 \end{aligned}$$

Industry average = 1.0

In general, debt increases risk. Debt places owners in a subordinate position relative to creditors because the claims of creditors must be satisfied first in case of liquidation. In addition, debt requires payment, usually on specific dates. Failure to pay debt interest and principal on a timely basis may

result in default and perhaps even bankruptcy. Other things being equal, the higher the debt to equity ratio, the higher the risk. The type of risk this ratio measures is called default risk because it presumably indicates the likelihood a company will default on its obligations. IGF's debt to equity ratio is not particularly high – in fact it's less than the industry average.

Requirement 2

Debt also can be used to enhance the return to shareholders. This concept is known as leverage. If a company earns a return on borrowed funds in excess of the cost of borrowing the funds, shareholders are provided with a total return greater than what could have been earned with equity funds alone. This desirable situation is called “favorable financial leverage.” Unfortunately, leverage is not always favorable. Sometimes the cost of borrowing the funds exceeds the returns they generate. This illustrates the typical risk-return tradeoff faced by shareholders.

IGF has experienced favorable leverage, as demonstrated by calculating and comparing the return on assets and the return on shareholders' equity for 2003:

$$\begin{aligned}
 \text{Rate of return on assets} &= \frac{\text{Net income}}{\text{Average total assets}} \\
 &= \frac{\$487}{[\$5,345 + 4,684] / 2} \\
 &= \underline{9.7\%}
 \end{aligned}$$

$$\begin{aligned}
 \text{Rate of return on shareholders' equity} &= \frac{\text{Net income}}{\text{Average shareholders' equity}} \\
 &= \frac{\$487}{[\$2,931 + 2,671] / 2} \\
 &= \underline{17.4\%}
 \end{aligned}$$

The debt to equity ratio is not particularly high, but the debt the company does have has been used to shareholders' advantage. The return on equity is greater than the return on assets. In fact, it may be that debt is being under-utilized by IGF. More debt might increase the potential for return, but the price would be higher risk. This is a fundamental tradeoff faced by virtually all firms when trying to settle on the optimal capital structure.

Requirement 3

Creditors generally demand interest payments as compensation for the use of their capital. Failure to pay interest as scheduled may cause several adverse consequences including bankruptcy. Therefore, another way to measure a company's ability to pay its obligations is by comparing interest payments with cash flow generated from operations. The times interest earned ratio does this by dividing income before subtracting interest expense or income tax expense by interest expense.

Case 14-10 (concluded)

$$\begin{aligned} \text{Times interest earned} &= \frac{\text{Net income} + \text{interest} + \text{taxes}}{\text{Interest}} \\ &= \frac{\$487 + 54 + 316}{\$54} \\ &= \underline{15.9 \text{ times}} \end{aligned}$$

Industry average = 5.1 times

Two points about this ratio are important. First, because interest is deductible for income tax purposes, income before interest and taxes is a better indication of a company's ability to pay interest than is income after interest and taxes (i.e., net income). Second, income before interest and taxes is a rough approximation for cash flow generated from operations. The primary concern of decision-makers is, of course, the cash available to make interest payments. In fact, this ratio often is computed by dividing cash flow generated from operations by interest payments.

IGF's fixed charges are covered over 15 times, far exceeding the industry norm. The interest coverage ratio seems to indicate an ample safety cushion for creditors, particularly when considered in conjunction with their debt-equity ratio. There seems also to be considerable room for additional borrowing in the event the firm wanted to increase its leverage in an attempt to further enhance the return to shareholders.