chapter 10

Reporting and Interpreting Bonds

In 1876, Alexander Graham Bell invented the telephone with the simple words "Watson, come here." Today's telecommunications industry carries a volume and variety of information that could not have been imagined by Mr. Bell. The AT&T network, for example, carries nearly 29 petabytes (equal to one quadrillion bytes) of data every day.

The technology and infrastructure necessary to support the telecommunications industry could not have been developed without billions of dollars of investment. One of the strengths of our economic system is the ability of corporations to raise large amounts of money from owners and creditors. In this chapter, we will discuss money raised from creditors by the issuance of bonds and in the next chapter, we will look at the issuance of stock to owners.

AT&T is a familiar name in the telecommunications industry. If you are one of the 103 million subscribers to its network, you may have already texted a message today using AT&T. The company is large by any measure. It offers network coverage in 225 countries, employs over 250,000 people, and reported over $125 billion in revenue last year. In order for AT&T to maintain its position as an industry leader, it must reinvest large amounts of money in its business. Last year alone, the company spent over $1 billion on research and development and $20 billion on capital improvements to its network.

Learning Objectives

After studying this chapter, you should be able to:

10-1 Describe the characteristics of bonds. p. 501

10-2 Report bonds payable and interest expense for bonds sold at par and analyze the times interest earned ratio. p. 505

10-3 Report bonds payable and interest expense for bonds sold at a discount. p. 508

10-4 Report bonds payable and interest expense for bonds sold at a premium. p. 513

10-5 Analyze the debt-to-equity ratio. p. 516

10-6 Report the early retirement of bonds. p. 517

10-7 Explain how financing activities are reported on the statement of cash flows. p. 518

FOCUS COMPANY:

AT&T

www.att.com

Like most capital-intensive companies, AT&T has employed a mixture of debt and equity capital to fund its business. AT&T has disclosed detailed information concerning its long-term debt in the note shown in Exhibit 10.1. Much of the terminology in this note will be new to you. After studying this chapter, you will understand each of the terms used in the note.

UNDERSTANDING THE BUSINESS

Capital structure is the mixture of debt and equity a company uses to finance its operations. Almost all companies employ some debt in their capital structure. Indeed, large corporations need to borrow billions of dollars, which makes borrowing from individual creditors impractical. Instead, these corporations issue bonds to raise debt capital.

Bonds are securities that corporations and governmental units issue when they borrow large amounts of money. After bonds have been issued, they can be traded on established exchanges such as the New York Bond Exchange. The ability to sell a bond on the bond exchange is a significant advantage for creditors because it provides them with liquidity, or the ability to convert their investments into cash. If you lend money directly to a corporation for 20 years, you must wait that long before your cash investment is repaid. If you lend money by purchasing a bond, you can always sell it to another creditor if you need cash before it matures.

The liquidity of publicly traded bonds offers an important advantage to corporations. Because most creditors are reluctant to lend money for long periods with no opportunity to receive cash prior to maturity, they demand a higher interest rate for long-term loans. By issuing more liquid debt, corporations can reduce the cost of long-term borrowing.

EXHIBIT 10.1

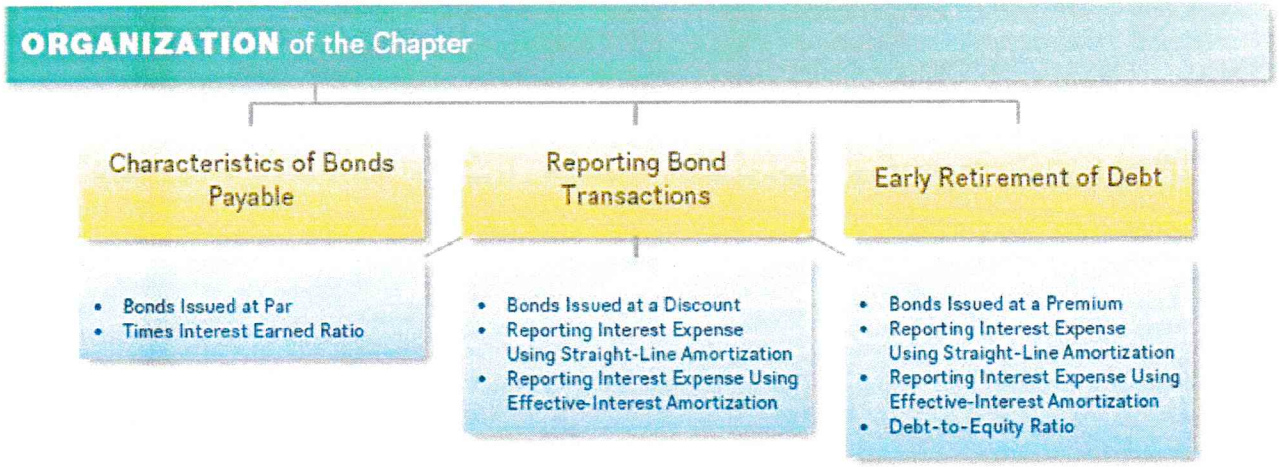
Note from AT&T Annual Report

NOTE 8. DEBT

Long-term debt of AT&T and its subsidiaries, including interest rates and maturities, is summarized as follows at December 31 (in millions):

			2011	2010
Notes and debentures	**Interest Rates**	**Maturities**		
	0.35%–2.99%	2011–2016	$ 5,500	$ 2,250
	3.00%–4.99%	2011–2021	8,659	5,880
	5.00%–6.99%	2011–2095	41,390	43,506
	7.00%–9.10%	2011–2097	8,471	11,986
	Other		3	14
Fair value of interest rate swaps recorded in debt			445	435
			64,468	64,071
Unamortized premium, net of discount			46	185
Total notes and debentures			64,514	64,256
Capitalized leases			239	259
Total long-term debt, including current maturities			64,753	64,515
Current maturities of long-term debt			(3,453)	(5,544)
Total long-term debt			$61,300	$58,971

This chapter provides a basic understanding of the management, accounting, and financial issues associated with bonds. We begin with a description of bonds payable. Then we see how bond transactions are analyzed and recorded. The chapter closes with a discussion of the early retirement of debt.



CHARACTERISTICS OF BONDS PAYABLE

LEARNING OBJECTIVE 10-1

Describe the characteristics of bonds.

Both stock and bonds are issued by corporations to raise money for long-term purposes. Several reasons why a corporation would want to issue bonds instead of stock are:

1. **Stockholders maintain control.** Bondholders do not vote or share in the company's earnings.
2. **Interest expense is tax-deductible.** The tax deductibility of interest expense reduces the net cost of borrowing. In contrast, dividends paid on stock are not tax deductible.
3. **The impact on earnings is positive.** Money can often be borrowed at a low interest rate and invested at a higher rate. Assume that Home Games, Inc., owns an electronic game rental store. The company has stockholders' equity of $100,000 invested in the store and earns net income of $20,000 per year. Management plans to open a new store that will also cost $100,000 and earn $20,000 per year. Should management issue new stock or borrow the money at an interest rate of 8 percent? The following analysis shows that the use of debt will increase the return to the owners:

	Option 1 Stock	Option 2 Debt
Income before interest and taxes	$ 40,000	$ 40,000
Interest (8% × $100,000)		8,000
Income before taxes	40,000	32,000
Income taxes (35%)	14,000	11,200
Net income	$ 26,000	$ 20,800
Stockholders' equity	$200,000	$100,000
Return on equity	13%	20.8%

Unfortunately, bonds carry higher risk than equity. The following are the major disadvantages associated with issuing bonds:

1. **Risk of bankruptcy.** Interest payments to bondholders are fixed charges that must be paid each period whether the corporation earns income or incurs a loss.
2. **Negative impact on cash flows.** Debt must be repaid at a specified time in the future. Management must be able to generate sufficient cash to repay the debt or have the ability to refinance it.

The BOND PRINCIPAL is the amount (a) payable at the maturity of the bond and (b) on which the periodic cash interest payments are computed.

A bond usually requires the payment of interest over its life with repayment of principal on the maturity date. The **bond principal** is the amount (1) that is payable at the maturity date and (2) on which the periodic cash interest payments are computed. The principal is also called the **par value, face amount,** and maturity value. All bonds have a par value, which is the amount that will be paid when the bond matures. For most individual bonds, the par value is $1,000, but it can be any amount.

PAR VALUE is another name for bond principal, or the maturity amount of a bond.

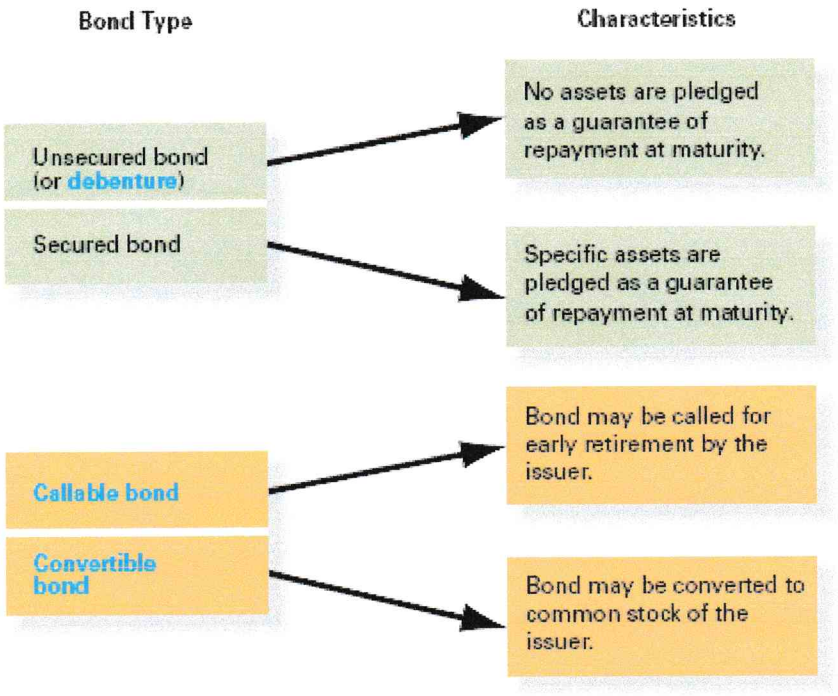
FACE AMOUNT is another name for bond principal, or the maturity amount of the bond.

A bond always specifies a **stated rate** of interest and the timing of periodic cash interest payments, usually annually or semiannually. Each periodic interest payment is computed as principal times the stated interest rate. The selling price of a bond does not affect the periodic cash payment of interest. For example, a $1,000, 8 percent bond always pays cash interest of (1) $80 on an annual basis or (2) $40 on a semiannual basis.

The STATED RATE is the rate of cash interest per period stated in the bond contract.

Different types of bonds have different characteristics for good economic reasons. Individual creditors have different risk and return preferences. A retired person may be willing to receive a lower interest rate in return for greater security. This type of creditor might want a mortgage bond that pledges a specific asset as security in case the company cannot repay the bond. Another type of creditor might be willing to accept a low interest rate and an unsecured status in return for the opportunity to convert the bond into common stock at some point in the future. Companies try to design bond features that are attractive to different groups of creditors

just as automobile manufacturers try to design cars that appeal to different groups of consumers. Some key types of bonds are shown in the illustration below.

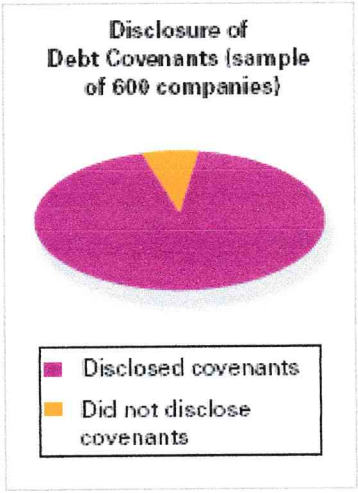


A DEBENTURE is an unsecured bond; no assets are specifically pledged to guarantee repayment.

A CALLABLE BOND may be called for early retirement at the option of the issuer.

A CONVERTIBLE BOND may be converted to other securities of the issuer (usually common stock).

An INDENTURE is a bond contract that specifies the legal provisions of a bond issue.



When AT&T decides to issue new bonds, it prepares a bond **indenture** (bond contract) that specifies the legal provisions of the bonds. These provisions include the maturity date, the rate of interest to be paid, the date of each interest payment, and any conversion privileges. The indenture also contains covenants designed to protect the creditors. Typical indentures include limitations on new debt that the company might issue in the future, limitations on the payment of dividends, or requirements for minimums of certain accounting ratios, such as the current ratio. Because covenants may limit the company's future actions, management prefers those that are least restrictive. Creditors, however, prefer more restrictive covenants, which lessen the risk of the investment. As with any business transaction, the final result is achieved through negotiation.

Bond covenants are typically reported in the notes to the financial statements. *Accounting Trends & Techniques* (published by the AICPA) has reviewed the reporting practices of 600 companies.[1] The graph in the margin shows the percentage of companies that disclosed debt covenants. AT&T reported the following information about its debt covenants.

AT&T

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Annual Report

Credit Agreement

The Agreement requires us to maintain a debt-to-EBITDA (earnings before interest, income taxes, depreciation and amortization) ratio of not more than 3-to-1, as of the last day of each fiscal quarter.

Defaults under the Agreement would permit the lenders to accelerate required repayment and would increase the interest by 2.00% per annum.

The bond issuer also prepares a prospectus, which is a legal document that is given to potential bond investors. The prospectus describes the company, the bonds, and how the proceeds of the bonds will be used. AT&T used the money it borrowed to increase working capital, make capital expenditures, and repurchase common stock.

A BOND CERTIFICATE is the bond document that each bondholder receives.

A TRUSTEE is an independent party appointed to represent the bondholders.

When a bond is issued to an investor, the person receives a **bond certificate.** All bond certificates for a single bond issue are identical. The face of each certificate shows the same maturity date, interest rate, interest dates, and other provisions. An independent party, called the **trustee,** is usually appointed to represent the bondholders. A trustee's duties are to ascertain whether the issuing company has fulfilled all provisions of the bond indenture.

Because of the complexities associated with bonds, several agencies exist to evaluate the probability that a bond issuer will not be able to meet the requirements specified in the indenture. This risk is called *default risk.* Moody's and Standard & Poor's use letter ratings to specify the quality of a bond. Bonds with ratings above Baa/BBB are investment grade; bonds with ratings below that level are speculative and are often called *junk bonds.* Many banks, mutual funds, and trusts are permitted to invest only in investment-grade bonds. In addition to evaluating the risk of a specific bond, analysts also assess the overall risk of the issuer.

FINANCIAL ANALYSIS  Bond Information from the Business Press

Bond prices are reported each day in the business press based on transactions that have occurred on the bond exchange. The following is typical of the information you will find:

Bond	Yield	Volume	Close	Change
Safeway 6.0 13	6.8	58	97.2	−1/4
Sears 6.5 17	6.77	25	98.1	−3/8
AT&T 6.3 38	4.2	169	132.68	−1/4

This listing states that the AT&T bond has a coupon interest rate of 6.3 percent and will mature in the year 2038. The bond currently provides an effective interest yield of 4.2 percent and has a selling price of 132.68 percent of par, or $1,326.80. On this date, 169 bonds were sold, and the price fell 1/4 point from the closing price on the previous trading day (a point is 1 percent).

It is important to remember that these changes do not affect the company's financial statements. For financial reporting purposes, the company uses the interest rates that existed when the bonds were first sold to

the public.

REPORTING BOND TRANSACTIONS

When AT&T issued its bonds, it specified two types of cash payment in the bond contract:

1. **Principal.** This amount is usually a single payment that is made when the bond matures. It is also called the **par value** or **face value.**
2. **Cash interest payments.** These payments, which represent an annuity, are computed by multiplying the principal amount times the interest rate stated in the bond contract. This interest is called the **contract, stated,** or **coupon rate** of interest. The bond contract specifies whether the interest payments are made quarterly, semiannually, or annually. When you are asked to work problems in which interest payments are made more frequently than once a year, you must adjust both the periodic interest rate and the number of periods. For example, a $1,000 (face value) bond with an annual interest rate of 6 percent and a life of 10 years would pay interest of $30 ($1,000 × 6% × 1/2) for 20 periods (every six months for 10 years, or 10 × 2).

The COUPON RATE is the stated rate of interest on bonds.

The issuing company does not determine the price at which the bonds sell. Instead, the market determines the price using the present value concepts introduced in the last chapter. To

determine the present value of the bond, you compute the present value of the principal (a single payment) and the present value of the interest payments (an annuity) and add the two amounts.

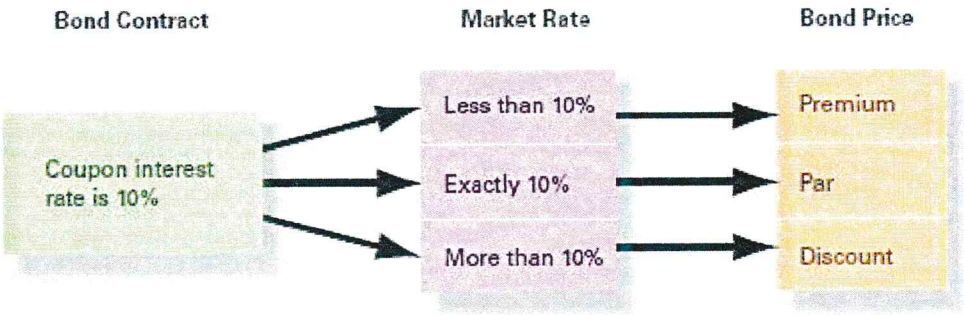
The MARKET INTEREST RATE (or YIELD or EFFECTIVE-INTEREST RATE) is the current rate of interest on a debt when incurred.

Creditors demand a certain rate of interest to compensate them for the risks related to bonds, called the **market interest rate** (also known as the **yield** or **effective-interest rate**). Because the market rate is the interest rate on debt when it is incurred, it is the rate that should be used in computing the present value of a bond.

BOND PREMIUM is the difference between the selling price and par when the bond is sold for more than par.

BOND DISCOUNT is the difference between the selling price and par when the bond is sold for less than par.

The present value of a bond may be the same as par, above par (**bond premium**), or below par (**bond discount**). If the stated and the market interest rates are the same, a bond sells at par; if the market rate is higher than the stated rate, a bond sells at a discount; and if the market rate is lower than the stated rate, the bond sells at a premium. This relationship can be shown graphically as follows:



In commonsense terms, when a bond pays an interest rate that is less than the rate creditors demand, they will not buy it unless its price is reduced (i.e., a discount must be provided). When a bond pays more than creditors demand, they will be willing to pay a premium to buy it.

When a bond is issued at par, the issuer receives cash equal to its par value. When a bond is issued at a discount, the issuer receives less cash than the par value. When a bond is issued at a premium, the issuer receives more cash than the par value. Corporations and creditors do not care whether a bond is issued at par, at a discount, or at a premium because bonds are always priced to provide the market rate of interest. To illustrate, consider a corporation that issues three separate bonds on the same day. The bonds are the same except that one has a stated interest rate of 8 percent, another a rate of 10

percent, and a third a rate of 12 percent. If the market rate of interest were 10 percent, the first would be issued at a discount, the second at par, and the third at a premium. As a result, a creditor who bought any one of the bonds would earn the market interest rate of 10 percent.

During the life of the bond, its market price will change as market interest rates change. While this information is reported in the financial press, it does not affect the company's financial statements and the way its interest payments are accounted for from one period to the next.

In the next section of this chapter, we will see how to account for bonds issued at par, at a discount, and at a premium.

PAUSE FOR FEEDBACK

SELF-STUDY **QUIZ**

Your study of bonds will be easier if you understand the new terminology that has been introduced in this chapter. Let's review some of those terms. Define the following:

1. Market interest rate.
2. Coupon interest rate.
3. Synonyms for *coupon interest rate.*
4. Bond discount.
5. Bond premium.
6. Synonyms for *market interest rate.*

After you have completed your answers, check them with the solutions at the bottom of the page.

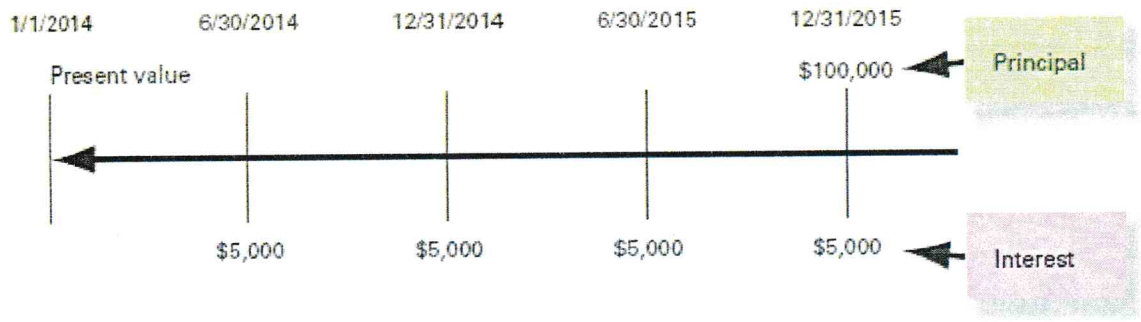
Bonds Issued at Par

LEARNING OBJECTIVE 10-2

Report bonds payable and interest expense for bonds sold at par and analyze the times interest earned ratio.

Bonds sell at their par value when buyers are willing to invest in them at the interest rate stated in the bond contract. To illustrate, let's assume that on January 1, 2014, AT&T issued 10 percent bonds with a par value of $100,000 and received $100,000 in cash (which means that the bonds sold at par). The bonds were dated to start earning interest on January 1, 2014, and will pay interest each June 30 and December 31. The bonds mature in two years on December 31, 2015.

The amount of money a corporation receives when it sells bonds is the present value of the future cash flows associated with them. When AT&T issued its bonds, it agreed to make two types of payments in the future: a single payment of $100,000 when the bond matures in two years, and an annuity of $5,000 payable twice a year for two years. The bond payments can be shown graphically as follows:



Solution to SELF-STUDY QUIZ

1. The market interest rate is the interest rate demanded by creditors. It is the rate used in the present value computations to discount future cash flows.
2. Coupon interest rate is the stated rate on the bonds.
3. Coupon interest rate is also called stated rate and contract rate.
4. A bond that sells for less than par is sold at a discount. This occurs when the coupon rate is lower than the market rate.
5. A bond that sells for more than par is sold at a premium. This occurs when the coupon rate is higher than the market rate.
6. Market interest rate is also called yield or effective-interest rate.

To compute the present value using Excel, enter:
f_x = PV(0.05,4, −5000, −100000)

The present value of the bond payments can be computed with the tables contained in Appendix A using the factor for four periods and an interest rate of 5 percent per period:

	Present Value
a. Single payment: $100,000 × 0.8227	$ 82,270
b. Annuity: $5,000 × 3.5460	17,730
Issue (sale) price of bonds	$100,000

When the effective rate of interest equals the stated rate of interest, the present value of the future cash flows associated with a bond always equals the bond's par value amount. Remember a bond's selling price is determined by the present value of its future cash flows, not the par value. On the date of issue, bond liabilities are recorded at the present value of future cash flows on the date of issue, not the par value, as follows:

Cash (+A)	100,000	
Bonds payable (+L)		100,000

Assets		=	Liabilities		+	Stockholders' Equity
Cash	+100,000		Bonds payable	+100,000		

Bonds may pay interest each month, each quarter, each half-year, or each year. In all cases, the present value of the bond is determined using the interest rate factor for the number of interest periods and the interest rate for each period.

PAUSE FOR FEEDBACK

SELF-STUDY **QUIZ**

Assume that AT&T issues $500,000 bonds that will mature in five years. The bonds pay interest at the end of each year at an annual rate of 8 percent. They are sold when the market rate is 8 percent. Compute the selling price of the bonds.

After you have completed your answer, check it with the solution at the bottom of the page.

Reporting Interest Expense on Bonds Issued at Par

Continuing with our example, the creditors who bought the AT&T bonds did so with the expectation that they would earn interest over the life of the bond. AT&T will pay interest at 10 percent per year on the par value of the bonds each June 30 and December 31 until the bond's maturity date. The

amount of interest each period will be $5,000 (10% × $100,000 × 1/2). The entry to record each interest payment is as follows:

Interest expense (+E, −SE)	5,000	
Cash (−A)		5,000

Assets		=	Liabilities	+	Stockholders' Equity	
Cash	−5,000				Interest expense (+E)	−5,000

Solution to SELF-STUDY QUIZ

1. $500,000 × 0.6806 = $340,300
($500,000 × 8%) × 3.9927 = 159,708
$500,000 (rounded)

Interest expense is reported on the income statement. Because interest is related to financing activities rather than operating activities, it is normally not included in operating expenses on the income statement. Instead, interest expense is reported as a deduction from "operating income." A portion of the income statement for AT&T shows how interest expense is usually reported.

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AT&T INC.
Consolidated Statements of Income
(dollars in millions, except per share amounts)

	2011	2010	2009
Other Income (Expense)			
Interest expense	(3,535)	(2,994)	(3,368)
Equity in net income of affiliates	784	762	734
Other income (expense) net	249	897	152
Total other income (expense)	(2,502)	(1,335)	(2,482)
Income from Continuing Operations Before Income Taxes	6,716	18,238	18,518
Income tax (benefit) expense	2,532	(1,162)	6,091
Income from Continuing Operations	4,184	19,400	12,427
Income from Discontinued Operations, net of tax	—	779	20
Net Income	4,184	20,179	12,447

AT&T

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Bond interest payment dates rarely coincide with the last day of a company's fiscal year. Under the matching concept, interest expense that has been incurred but not paid must be accrued with an adjusting entry. If AT&T's fiscal year ended on May 31, the company would accrue interest for five months and record interest expense and interest payable.

Because interest payments are a legal obligation for the borrower, financial analysts want to be certain that a business is generating sufficient resources to meet its obligations. The times interest earned ratio is useful when making this assessment.

KEY RATIO ANALYSIS  Times Interest Earned

ANALYTICAL QUESTION

Is the company generating sufficient resources from its profit-making activities to meet its current interest obligations?

RATIO AND COMPARISONS

The times interest earned ratio is computed as follows:

$$\text{Times Interest Earned} = \frac{\text{Net Income} + \text{Interest Expense} + \text{Income Tax Expense}}{\text{Interest Expense}}$$

The 2011 ratio for AT&T:

$$(\$3{,}944 + \$3{,}535 + \$2{,}532) \div \$3{,}535 = 2.8$$

COMPARISONS OVER TIME		
AT&T		
2009	2010	2011
6.4	7.2	2.8

COMPARISONS WITH COMPETITORS	
Verizon	Sprint
2011	2011
2.0	N/A

INTERPRETATIONS

In General A high times interest earned ratio is viewed more favorably than a low one. The ratio shows the amount of resources generated for each dollar of interest expense. A high ratio indicates an extra margin of protection in case profitability deteriorates. Analysts are particularly interested in a company's ability to meet its required interest payments because failure to do so could result in bankruptcy.

Focus Company Analysis In 2011, profit-making activities for AT&T generated $2.80 for each dollar of interest, a reasonable safety margin. The ratio is significantly lower than previous years because AT&T's net income declined by approximately 80 percent during 2011. Nevertheless, AT&T is able to generate significant cash flows from its operating activities. Also, the ratio is in line with other companies in the industry. Required interest payments do not appear to be at risk. Notice that we are not able to compute a ratio for Sprint. The company reported a loss in 2011, which results in a meaningless ratio.

A Few Cautions The times interest earned ratio is often misleading for new or rapidly growing companies, which tend to invest considerable resources to build their capacity for future operations. In such cases, the times interest earned ratio will reflect significant amounts of interest expense associated with the new capacity but not the income that will be earned with the new capacity. Analysts should consider the company's long-term strategy when using this ratio. Some analysts prefer to compare interest expense to the amount of cash a company can generate. Because creditors cannot be paid with "income" that is generated, they must be paid with cash.

Bonds Issued at a Discount

LEARNING OBJECTIVE 10-3

Report bonds payable and interest expense for bonds sold at a discount.

Bonds sell at a discount when the market rate of interest is higher than the stated interest rate on them. Let's assume that the market rate of interest was 12 percent when AT&T sold its bonds (which have a par value of $100,000). The bonds mature in two years and have a stated rate of 10 percent,

payable twice a year on June 30 and December 31. Because the stated rate of interest was less than the market rate on the date of issue, the bonds sold at a discount.

To compute the cash issue price of the bonds, we can use the tables in Appendix A. As in the previous example, the number of periods is four and we use an interest rate of 6 percent per period, which is the market rate of interest. The cash issue price of the AT&T bonds is computed as follows:

To compute the present value using Excel, enter:
f_x = PV(0.06,4, −5000, −100000)

	Present Value
a. Single payment: $100,000 × 0.7921	$79,210
b. Annuity: $5,000 × 3.4651	17,326
Issue (sale) price of bonds	$96,536*

**The amount of the discount: $100,000 − $96,536 = $3,464.*

The cash price of the bonds issued by AT&T is $96,536. Some people refer to this price as 96.5, which means that the bonds were sold at 96.5 percent of their par value ($96,536 ÷ $100,000).

When a bond is sold at a discount, the Bonds Payable account is credited for the par amount, and the discount is recorded as a debit to Discount on Bonds Payable. The issuance of the AT&T bonds at a discount is recorded as follows:

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Cash (+A)	96,536	
Discount on bonds payable (+XL, −L)	3,464	
Bonds payable (+L)		100,000

Assets		=	Liabilities		+	Stockholders' Equity
Cash	+96,536		Bonds payable	+100,000		
			Discount on bonds	−3,464		

Note that the discount is recorded in a separate contra-liability account (Discount on Bonds Payable) as a debit. The balance sheet reports the bonds payable at their book value, which is their maturity amount less any unamortized discount. AT&T reports its discount as a net amount with its bond premium (explained in the next section). This approach is appropriate when the amount is small relative to other balance sheet amounts.

While AT&T received only $96,536 when it sold the bonds, it must repay $100,000 when the bonds mature. The extra cash that must be paid is an adjustment of interest expense to ensure that creditors earn the market rate of interest. To adjust interest expense, the borrower apportions or amortizes the bond discount to each interest period as an increase in interest expense. Therefore, the amortization of bond discount results in an increase in interest expense. Two amortization methods are often used by companies: (1) straight line and (2) effective interest. Many companies use straight-line amortization because it is easy to compute the required numbers. However, the effective-interest method is the method required by GAAP. You may wonder why companies are permitted to use a method that is not the one required by accounting rules. The answer is materiality. Companies are permitted to use the straight-line method because the results are normally not materially different from those computed using the effective-interest method. We will first discuss the straight-line method and then the effective-interest method.

Part A: Reporting Interest Expense on Bonds Issued at a Discount Using Straight-Line Amortization

STRAIGHT-LINE AMORTIZATION is a simplified method of amortizing a bond discount or premium that allocates an equal dollar amount to each interest period.

To amortize the $3,464 bond discount over the life of AT&T bonds using **straight-line amortization,** we allocate an equal dollar amount to each interest period. AT&T bonds have four interest periods. The amortization of discount each period is: $3,464 ÷ 4 periods = $866. We add this amount to the cash payment of interest ($5,000) to compute interest expense for the period ($5,866). The interest payments on AT&T bonds each period are as follows:

Interest expense (+E, −SE)	5,866	
Discount on bonds payable (−XL, +L)		866
Cash (−A)		5,000

Assets		=	Liabilities		+	Stockholders' Equity	
Cash	−5,000		Discount on bonds	+866		Interest expense (+E)	−5,866

Bonds payable are reported on the balance sheet at their book value. At the end of the first interest period (June 30, 2014), the book value of AT&T bonds is more than the original issue price. The book value increases to $97,402 ($96,536 + $866) because of the amortization of the discount. In each interest period, the book value of the bonds increases by $866 because the unamortized discount decreases by $866. At the maturity date of the bonds, the unamortized discount (i.e., the balance in the Discount on Bonds Payable account) is zero. At that time, the

maturity amount of the bonds and the book value are the same (i.e., $100,000). This process can be seen in the following amortization schedule:

	AMORTIZATION SCHEDULE: BOND DISCOUNT (STRAIGHT-LINE)			
Date	(a) Interest to Be Paid (10% × $100,000 × 1/2)	(b) Interest Expense (a + c)	(c) Amortization ($3,464 ÷ 4 periods)	(d) Book Value Beginning Book Value + (c)
1/1/2014				$96,536
6/30/2014	$5,000	$5,866	$866	97,402
12/31/2014	5,000	5,866	866	98,268
6/30/2015	5,000	5,866	866	99,134
12/31/2015	5,000	5,866	866	100,000

PAUSE FOR FEEDBACK

SELF-STUDY **QUIZ**

Assume that AT&T issued $100,000 bonds that will mature in 10 years. The bonds pay interest at the end of each year at an annual rate of 5 percent. They were sold when the market rate was 6 percent at a price of $92,641. What amount of interest was paid at the end of the first year? What amount of interest expense would be reported at the end of the first year using straight-line amortization?

After you have completed your answers, check them with the solutions at the bottom of the page.

Part B: Reporting Interest Expense on Bonds Issued at a Discount Using Effective-Interest Amortization

EFFECTIVE–INTEREST AMORTIZATION is a method of amortizing a bond discount or premium on the basis of the effective-interest rate; it is the theoretically preferred method.

Under the **effective-interest amortization** method, interest expense for a bond is computed by multiplying the current unpaid balance times the market rate of interest that existed on the date the bonds were sold. The periodic amortization of a bond premium or discount is then calculated as the difference between interest expense and the amount of cash paid or accrued. This process can be summarized as follows:

Step 1: Compute interest expense

Unpaid Balance × Effective-Interest Rate × n/12

n = Number of Months in Each Interest Period

Step 2: Compute amortization amount

Interest Expense − Cash Interest

The first interest payment on AT&T bonds is made on June 30, 2014. Interest expense at the end of the first interest period (June 30, 2014) is calculated by multiplying the

unpaid balance of the debt by the market rate of interest ($96,536 × 12% × 1/2 = $5,792). The amount of cash paid is calculated by multiplying the principal by the stated rate of interest ($100,000 × 10% × 1/2 = $5,000). The difference between the interest expense and the cash paid (or accrued) is the amount of discount that has been amortized ($5,792 − $5,000 = $792).

Solution to SELF-STUDY QUIZ

1. $5,000 (5% × $100,000)
2. $5,736 [$5,000 + ($7,359 ÷ 10)]

Effective-interest amortization causes these amounts to change each period.

Interest expense (+E, −SE)	5,792	
Discount on bonds payable (−XL, +L)		792
Cash (−A)		5,000

Assets		=	Liabilities		+	Stockholders' Equity	
Cash	−5,000		Discount on bonds	+792		Interest expense (+E)	−5,792

Each period, the amortization of the bond discount increases the bond's book value (or unpaid balance). The amortization of bond discount can be thought of as interest earned by the bondholders but not paid to them. During the first interest period, the bondholders earned interest of $5,792 but received only $5,000 in cash. The additional $792 was added to the book value of the bond and will be paid to bondholders when the bond matures.

Interest expense for the next interest period must reflect the change in the unpaid balance of bonds payable that occurred with amortization of the bond discount. The interest expense for the second half of 2014 is calculated by multiplying the unpaid balance ($96,536 + $792 = $97,328) on June 30, 2014, by the market rate of interest ($97,328 × 12% × 1/2 = $5,840). Thus amortization of the bond discount on December 31, 2014, is $840.

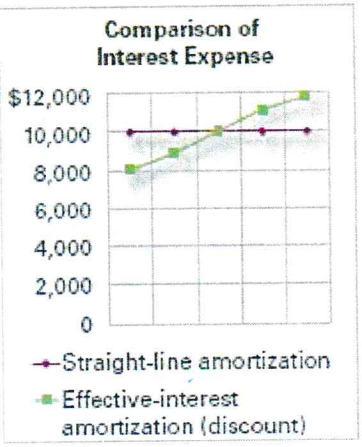
Interest expense (+E, −SE)	5,840	
Discount on bonds payable (−XL, +L)		840
Cash (−A)		5,000

Assets		=	Liabilities		+	Stockholders' Equity	
Cash	−5,000		Discount on bonds	+840		Interest expense (+E)	−5,840

Notice that interest expense for December 31, 2014, is more than interest expense for June 30, 2014. AT&T effectively borrowed more money during the second half of the year because of the unpaid interest. Because of the amortization of the bond discount, interest expense increases each year during the life of the bond. This process can be illustrated with the amortization schedule shown below:

	AMORTIZATION SCHEDULE: BOND DISCOUNT (EFFECTIVE-INTEREST)			
Date	(a) Interest to Be Paid (10% × $100,000 × 1/2)	(b) Interest Expense (12% × Beginning of Period Book Value × 1/2)	(c) Amortization (b) − (a)	(d) Book Value Beginning Book Value + (c)
1/1/2014				$ 96,536
6/30/2014	$5,000	$5,792	$792	97,328
12/31/2014	5,000	5,840	840	98,168
6/30/2015	5,000	5,890	890	99,058
12/31/2015	5,000	5,943	943	100,001*

**This amount should be exactly $100,000. The $1 error is due to rounding.*



Interest expense (column b) is computed by multiplying the market rate of interest by the book value of the bonds at the beginning of the period (column d). Amortization is computed by subtracting cash interest (column a) from interest expense (column b). The book value of the bonds (column d) is computed by adding amortization (column c) to the book value at the beginning of the period. In summary, under the effective-interest amortization method, interest expense changes each accounting period as the effective amount of the liability changes. Under the straight-line amortization method, interest expense remains constant over the life of the bond. The chart in the margin illustrates these differences.

PAUSE FOR FEEDBACK

SELF-STUDY QUIZ

Assume that AT&T issued $100,000 bonds that will mature in 10 years. The bonds pay interest at the end of each year at an annual rate of 5 percent. They were sold when the market rate was 6 percent at a price of $92,641. What amount of interest was paid at the end of the first year? What amount of interest expense would be reported at the end of the first year using effective-interest amortization?

After you have completed your answers, check them with the solutions at the bottom of the page.

FINANCIAL ANALYSIS  Zero Coupon Bonds

So far, we have discussed common bonds, which are issued by many corporations. For a number of reasons, corporations also may issue bonds with unusual features. The concepts you have learned will help you understand these bonds. For example, a corporation might issue a bond that does not pay periodic cash interest. These bonds are often called *zero coupon bonds.* Why would an investor buy a bond that did not pay interest? Our discussion of bond discounts has probably given you a good idea of the answer. The coupon interest rate on a bond can be virtually any amount and the price of the bond will be adjusted so that investors earn the market rate of interest. A bond with a

zero coupon interest rate is simply a deeply discounted bond that will sell for substantially less than its maturity value.

Let's use the $100,000 AT&T bond to illustrate a zero coupon rate. Assume that the market rate is 10 percent and the bond pays no cash interest. The bond matures in five years. The selling price of the bond is the present value of the maturity amount because no other cash payments will be made over the life of the bond. We can compute the present value with the tables contained in Appendix A, using the factor for five periods and an interest rate of 10 percent:

	Present Value
Single payment: $100,000 × 0.6209	$62,090

To compute the present value using Excel, enter:
= 100000/(1.10)^5

Accounting for a zero coupon bond is no different from accounting for other bonds sold at a discount. However, the amount of the discount is much larger. For example, the

annual report for AT&T contained the following information concerning the company's zero coupon bonds:

Solution to SELF-STUDY QUIZ

1. $5,000 (5% × $100,000)
2. $5,558 (6% × $92,641)

AT&T INC. AND SUBSIDIARY DEBT DETAIL—MARCH 31, 2012
This chart shows the principal amount of AT&T Inc.'s and its subsidiaries' outstanding long-term debt issues as of the date above.

Entry (Original Issuer)	Amount Outstanding at Maturity	Coupon	Maturity Date	Total
BellSouth Telecommunications, Inc.	$ 115,968,616	6.300%	12/15/15	$ 115,968,616
Ameritech Capital Funding Corporation	$ 52,502,760	9.100%	6/1/16	$ 52,502,760
Various	$ 3,143,969	Various	Various	$ 3,143,969
BellSouth Corporation	$1,000,000,000	4.463%	4/26/21	$1,000,000,000
AT&T Inc.	$1,030,000,000	Zero	11/27/22	$ 616,127,631

AT&T

REAL WORLD EXCERPT
Annual Report

While zero coupon bonds do not pay cash interest, they have been priced to provide the investor with a market rate of interest. Notice that the carrying value of the obligation ($616,127,631) is much lower than the maturity value ($1,000,000,000) because the payment has been discounted at the market rate of interest that existed on the issue date.

Bonds Issued at a Premium

LEARNING OBJECTIVE 10-4

Report bonds payable and interest expense for bonds sold at a premium.

Bonds sell at a premium when the market rate of interest is lower than their stated interest rate. Let's assume that the market rate of interest is 8 percent while the AT&T bonds pay cash interest of 10 percent. The bonds pay interest semiannually and mature in two years. They are issued on January 1, 2014.

The present value of AT&T 10 percent bonds can be computed from the tables contained in Appendix A using the factor for four periods and an interest rate of 4 percent per period:

To compute the present value using Excel, enter:
f_x = PV(0.04,4, −5000, −100000)

	Present Value
a. Single payment: $100,000 × 0.8548	$ 85,480
b. Annuity: $5,000 × 3.6299	18,150
Issue (sale) price of bonds	$103,630*

**The amount of the premium: $103,630 − $100,000 = $3,630.*

When a bond is sold at a premium, the Bonds Payable account is credited for the par amount, and the premium is recorded as a credit to Premium on Bonds Payable. The January 1, 2014, issuance of AT&T bonds at a premium would be recorded as follows:

Cash (+A)	103,630	
Premium on bonds payable (+L)		3,630
Bonds payable (+L)		100,000

Assets		=	Liabilities		+	Stockholders' Equity
Cash	+103,630		Premium on bonds	+3,630		
			Bonds payable	+100,000		

The book value of the bond is the sum of the two accounts, Premium on Bonds Payable and Bonds Payable, or $103,630.

Part A: Reporting Interest Expense on Bonds Issued at a Premium Using Straight-Line Amortization

As with a discount, the recorded premium of $3,630 must be apportioned to each interest period. Using the straight-line method, the amortization of premium each annual interest period is $908 ($3,630 ÷ 4 periods). This amount is subtracted from the cash interest payment ($5,000) to calculate interest expense ($4,092). Thus, amortization of a bond premium decreases interest expense.

The payment of interest on the bonds is recorded as follows:

Interest expense (+E, −SE)	4,092	
Premium on bonds payable (−L)	908	
Cash (−A)		5,000

Assets		=	Liabilities		+	Stockholders' Equity	
Cash	−5,000		Premium on bonds	−908		Interest expense (+E)	−4,092

Notice that the $5,000 cash paid each period includes $4,092 interest expense and $908 premium amortization. Thus, the cash payment to investors includes the current interest they have earned plus a return of part of the premium they paid when they bought the bonds.

The book value of the bonds is the amount in the Bonds Payable account plus any unamortized premium. On June 30, 2014, the book value of the bonds is $102,722 ($100,000 + $3,630 − $908). A complete amortization schedule follows:

	AMORTIZATION SCHEDULE: BOND PREMIUM (STRAIGHT-LINE)			
Date	(a) Interest to Be Paid (10% × $100,000 × 1/2)	(b) Interest Expense (a − c)	(c) Amortization ($3,630 ÷ 4 periods)	(d) Book Value Beginning Book Value − (c)
1/1/2014				$103,630
6/30/2014	$5,000	$4,092	$908	102,722
12/31/2014	5,000	4,092	908	101,814
6/30/2015	5,000	4,092	908	100,906
12/31/2015	5,000	4,092	908	99,998*

**This amount should be exactly $100,000. The $2 error is due to rounding.*

At maturity, after the last interest payment, the bond premium is fully amortized and the maturity amount equals the book value of the bonds. When the bonds are paid off in full, the same entry will be made whether the bond was originally sold at par, at a discount, or at a premium. Exhibit 10.2 compares the effects of the amortization of a bond discount and a bond premium on a $1,000 bond.

PAUSE FOR FEEDBACK

SELF-STUDY QUIZ

Assume that AT&T issued $100,000 bonds that will mature in 10 years. The bonds pay interest at the end of each year at an annual rate of 9 percent. They were sold when the market rate was 8 percent at a price of $106,711. What amount of interest was paid at the end of the first year? What amount of interest expense would be reported at the end of the first year using straight-line amortization?

After you have completed your answers, check them with the solutions at the bottom of next page.