

ACC101 – CHAPTER 10

Accounting for Long-Term Liabilities



Key Terms and Concepts to Know

Present Value:

There is an old saying that time is money. Applied to accounting, it means that a dollar today is worth more to an investor or company than a dollar to be received in the future. The sooner the dollar is received, the longer it can be invested and used to generate more dollars. Therefore in order to properly compare a series of cash inflows and outflows occurring in various years, present value must be used to restate all of the cash inflows and outflows in current period dollars.

- Present value is based on compound interest, that is, current period interest is based on the principal amount plus the interest for all prior periods.
- Future cash flows are discounted back to the year when the bond was issued. The term discounting is appropriate because the future cash flows are worth less than their full amount today because we had to wait to receive them.
- Certain future cash flows may be annuities if they consist of equal amounts received or paid with equal frequency. Annuities are discounted using the Present value of an Annuity of \$1 table.
- All other future cash flows are considered single payment cash flows. Single payments are discounted using the Present Value of \$1 table.

Bonds:

- Bonds are a medium to long-term financing alternative to issuing stock.
- Bonds are issued or sold face amount or par, at a discount if they pay less than the current market rate of interest, or a premium if they pay more than the current market interest rate.
- Bonds typically pay interest twice a year, i.e., semi-annually.
- The price of a bond is stated as a percent of face value, although the percent sign is not used. Therefore a \$1,000 bond selling at 101 is selling at 101% of face value or \$1,010. The "extra" \$10 received when the bond is issued or sold represents the premium.
- Required journal entries include
 - a. issuing the bond at par, discount or premium
 - b. calculating and recording the bond interest payments
 - c. calculating and recording amortization of the discount or premium
 - d. retiring the bonds at maturity
 - e. retiring the bonds prior to maturity and calculating the gain or loss on retirement
- Be able to calculate the interest expense for the year including the amortization of the premium or discount

Notes:

- Installment notes are loans that are repaid in a series of equal payments over a number of years.

Revised September 2007

- The payment amounts generally remain constant, with each successive payment made up of a decreasing amount going toward interest expense and an increasing amount going toward principal repayment.
- If the notes are to be repaid in a series of equal payments over a number of years, the principal amount of the note must be divided by the present value of an annuity factor to calculate the amount of each payment. The interest portion of each payment is the notes' interest rate X the balance of the note outstanding for the prior period.

Leases:

- Leases are rental agreements.
- Operating leases provide use of the property to the lessee with the lessor retaining the risks and rewards of ownership during and after the lease. Lease payments are expense to the lessee.
- Capital leases transfer the risks and rewards of ownership to the lessee. These leases are less like a rental and more like a purchase agreement which provides for periodic payments over a specified time period. The lessee records the capital lease as debt and records the leased asset as a fixed assets as if it had been purchased.

Compute the debt-to-equity ratio

The Concept of Present Value

1. Present Value of a Lump Sum

- a lump sum is an amount expected to be received or paid in the future
- the unknown is what the amount is worth in today's dollars
- to solve, the following information must be known:
 - the number of interest compounding periods
 - the interest rate per compounding period
- Use the Present Value of \$1 Table by selecting the row equal to the number of periods and the column equal to the interest rate

Example #1

If the current rate of interest is 10% and interest is compounded semiannually, what is the present value of receiving \$10,000 at the end of 7 years?

There are 14 interest compounding periods (7 years x 2)

The interest rate per compounding period is 5% (10%/2)

Rate from the PV of \$1 Table = .50507

Present Value = $10,000 * .50507 = \$5,050.70$

2. Present Value of an Annuity

- An annuity is a series of equal payments expected to be received or paid at regular future intervals
- the unknown is what the series of payments or receipts is worth in today's dollars?
- to solve, the following information must be known:
 - the number of interest compounding periods
 - the interest rate per compounding period
- Use the Present Value of an Annuity of \$1 Table by selecting the row equal to the number of periods and the column equal to the interest rate

Example #2

If the current interest rate is 12% and interest is compounded semiannually, what is the present value of receiving \$5,000 each year for 10 years?

There are 20 compounding periods (10 years x 2)

The interest rate per compounding period is 6% (12%/2)

Rate from the PV of Annuity Table = 11.46992

Present Value = $5,000 * 11.46992 = \$57,349.60$

Practice Problem #1

- a. Alpha Company is considering prepaying their rent for the next 4 years to avoid a price increase. Currently they pay \$8,000 per year. Calculate the present value of the rent payments to determine what amount Alpha should pay today if current interest rates are 12% and interest is compounded annually.
- b. Omega, Inc. won a lawsuit and will be receiving \$400,000 at the end of 5 years. Calculate the present value of this award if interest is compounded semiannually and the current interest rate is 1) 18% and 2) 10%.
- c. Bonnie has just received news of her inheritance. She will be receiving \$10,000 per year for the next 20 years and a lump sum payout after 20 years of \$200,000. Calculate the present value of her inheritance if the current interest rate is 9% and it is compounded annually.

Accounting for Bonds Payable

Calculating the Selling Price of a Bond

- Companies usually pay interest to the bondholder semiannually and repay the face value of the bond at maturity.
- The series of interest payments represents an annuity.
- The repayment of face value at maturity represents a lump sum or single payment
- The selling price of a bond is calculated as:
 The present value of the face value (lump sum) +
 The present value of the interest payments (annuity)
- Interest payments are calculated using the contract interest rate
- The present value of the future cash outflows is calculated using the current market interest rate

Example #3

Beta Company issued \$4,000,000 of 10-year, 11% bonds on January 4. The Bonds pay interest semiannually on June 30 and December 31. If the current market rate of interest is 10%, at what price will the bonds sell for?

$$\text{Interest Payment} = 4,000,000 * .11 * \frac{1}{2} \text{ year} = \$220,000$$

$$\text{Number of compounding periods} = 10 \text{ years} * 2 = 20$$

$$\text{Interest rate per compounding period} = 10\%/2 = 5\%$$

$$\text{PV of Face Value: } 4,000,000 * .37689 \text{ (20 periods, 5\%)} = \$1,507,560$$

$$\text{PV of Interest: } 220,000 * 12.46221 \text{ (20 periods, 5\%)} = \underline{\underline{\$2,741,686}}$$

$$\text{Selling Price of Bond: } \$4,249,246$$

Revised September 2007

This bond is selling at a premium – a price higher than its face value. The premium on this bond is \$249,246 (4,000,000 – 4,249,246)

Journal Entry for Issuance of Bonds

Cash	4,249,246	
Bonds Payable		4,000,000
*Premium on Bonds Payable		249,246

When a bond sells at a discount – a price less than face value – a debit is made to Discount on Bonds Payable for the amount of the discount.

Journal Entry for Each Interest Payment

Interest Expense	220,000	
Cash		220,000

Practice Problem #2

Gamma, Inc. issued 8,000,000 of 7-year, 9% bonds on January 2. The bonds pay interest semiannually on June 30 and December 31. The current market rate of interest is 12%.

- Calculate the selling price of the bonds, rounded to the nearest dollar, and journalize the entry to issue the bonds at that price.
- Journalize the entry to pay interest on June 30.

Amortizing Bond Premiums and Bond Discounts

- a bond premium represents a reduction in interest expense
- a bond discount represents an increase in interest expense
- a portion of the premium or discount must be amortized to interest expense each period
- amortization is usually done at the end of the period, however it may be done each time interest is paid.

Example #4

From Example #3, the bonds that were issued at a premium on January 4:

Cash	4,249,246	
Bonds Payable		4,000,000
Premium on Bonds Payable		249,246

The Premium on Bonds Payable should be amortized over the remaining life of the bonds. Since these were 10-year bonds, the annual amortization using the straight-line method would be as follows:

$$\frac{249,246}{10} = \$24,924.60/\text{year}$$

Journal Entry for Amortization of Premium

Premium on Bonds Payable	24,924.60	
Interest Expense		24,924.60

The debit to Premium on Bonds Payable reduces that account.
The credit to Interest Expense reduces interest expense.

**If the amortization had been combined with the payment of interest, then the entries would be as follows:

6/30	Premium on Bonds Payable	12,462.30	
	Interest Expense	207,537.70	
	Cash		220,000.00

12/31	Premium on Bonds Payable	12,462.30	
	Interest Expense	207,537.70	
	Cash		220,000.00

Total Amortization for the year: $12,462.30 + 12,462.30 = 24,924.60$

Total Interest Expense for the year: $207,537.70 + 207,537.70 = 415,075.40$

OR: $440,000 \text{ paid} - 24,924.60 \text{ amortized} = 415,075.40$

Journal Entry for Amortization of Discount

Interest Expense	XXX	
Discount on Bonds Payable		XXX

The debit to Interest Expense increases interest expense
The credit to Discount on Bonds Payable decreases that account

Bond Redemptions

Redeeming the bonds prior to maturity:

1. Amortize the bonds to the date of sale and determine the new balance of the premium or discount account
2. Remove the bonds payable account with a debit
3. Remove the premium or discount account with a debit or credit, respectively
4. Record a gain if the redemption price is less than the carrying value of the bonds
5. Record a loss if the redemption price is greater than the carrying value of the bonds

$$\text{Carrying Value} = \text{Bonds Payable} + \text{Premium on Bonds Payable}$$

$$\text{OR Bonds Payable} - \text{Discount on Bonds Payable}$$

Example #5

At the end of the 6th year, the bonds from Example #3 were redeemed at 102.

Premium on Bonds Payable Balance:

$$\begin{aligned}\text{Amortization} &= 24,924.60 * 6 \text{ years} = & 149,547.60 \\ \text{Account Balance} &= 249,246 - 149,547.60 = & 99,698.40\end{aligned}$$

Bonds Payable Balance = 4,000,000

Redemption Price = 4,000,000 * 102% = 4,080,000.00

Carrying Value = 4,000,000 + 99,698.40 = 4,099,698.40

Gain (Redemption < CV) = 4,099,698.40 - 4,080,000 = 19,698.40

Journal Entry

Bonds Payable	4,000,000.00
Premium on Bonds Payable	99,698.40
Cash	4,080,000.00
Gain on Redemption	19,698.40

Example #6

Journalize the following entries.

2001

July 1 Issued \$20,000,000 of 8-year 12% callable bonds dated July 1, 2001 at an effective interest rate of 14%, receiving cash of \$18,110,780. Interest is paid semiannually on December 31 and June 30.

Dec. 31 Paid the semiannual interest on the bonds.

Recorded the bond discount amortization for 6 months using the straight-line method.

Closed the interest expense account.

Revised September 2007

2002

June 30 Paid the semiannual interest on the bonds.

July 1 Redeemed the bonds at 95. (Record amortization for six months on the bonds first, then record the redemption)

Solution to Example #6

Selling Price of Bond: $(20,000,000 * .33874) + (1,200,000 * 9.44665)$

2001

July 1	Cash	18,110,780	
	Discount of Bonds Payable	1,889,220	
	Bonds Payable		20,000,000

Dec. 31	Interest Expense	1,200,000	
	Cash		1,200,000
	$(20,000,000 * .12 * \frac{1}{2} \text{ year})$		

Dec. 31	Interest Expense	18,076	
	Discount on Bonds Payable		118,076
	$(1,889,220 / 8 \text{ years} * \frac{1}{2} \text{ year} = 118,076 \text{ rounded})$		

Dec. 31	Income Summary	1,318,076	
	Interest Expense		1,318,076

2002

June 30	Interest Expense	1,200,000	
	Cash		1,200,000

July 1	Interest Expense	118,076	
	Discount on Bonds Payable		118,076
	$(1,889,220 / 8 \text{ years} * \frac{1}{2} \text{ year} = 118,076 \text{ rounded})$		

Balance in the discount account on the date of redemption is

$1,889,220 - 118,076 - 118,076 = 1,653,068$

Bonds Payable	20,000,000	
Loss on Redemption		653,068
Discount on Bonds Payable		1,653,068
Cash		19,000,000

Redemption price: $20,000,000 * 95\% = 19,000,000$ cash paid

Loss: (redemption price > carrying value)

$19,000,000 - 18,346,932 = 653,068$

Revised September 2007

Practice Problem #3

Journalize the following entries. Round all amounts to the nearest dollar.

2003

- Sept 2 Issued \$5,000,000 of 10-year, 15% callable bonds at an effective interest rate of 14% receiving cash of \$5,529,704. Interest is payable semiannually on September 1 and March 1.
- Dec. 31 Recorded 4 months of accrued interest on the bonds.
- Dec. 31 Amortized the bond premium for 4 months.
- Dec. 31 Closed the interest expense account.

2004

- Jan. 1 Reversed the accrual entry made on December 31.
- Mar 1 Paid the semiannual interest on the bonds.
- Sept 1 Paid the semiannual interest on the bonds.
- Dec. 31 Recorded 3 months of accrued interest on the bonds.
- Dec. 31 Amortized the bond premium for the year.
- Dec. 31 Closed the interest expense account

2005

- Feb. 2 Redeemed the bonds at 108. The balance in the Premium on Bonds account after amortizing to the date of sale is \$454,663.

SAMPLE MULTIPLE CHOICE QUESTIONS

1. Number of times interest charges earned is computed
 - a. Income before income taxes less Interest Expense divided by Interest Expense.
 - b. Income before income taxes divided by Interest Expense.
 - c. Income before income taxes plus Interest Expense divided by Interest Revenue.
 - d. Income before income taxes plus Interest Expense divided by Interest Expense.
2. The account, Investment in bonds, is reported
 - a. At cost as a long-term liability along with the current portion reported as a current liability.
 - b. At cost as a long-term asset less any amortized premium, or plus any amortized discount.
 - c. At fair market value because that is all that is required.
 - d. At cost as a long-term assets less Discount on Bonds Investments or plus Premium on Bond Investments.

Revised September 2007

3. One potential advantage of financing corporations through the use of bonds rather than common stock is:
- The interest on bonds must be paid when due
 - The interest expense is deductible for tax purposes by the corporation.
 - The corporation must pay the bonds at maturity.
 - A higher earnings per share is guaranteed for existing common shareholders.
4. When the contract rate of interest on bonds is higher than the market rate of interest, the bonds sell at:
- their face value
 - their maturity value
 - a discount
 - a premium
5. Sinking Fund Cash would be classified on the balance sheet as:
- a current asset
 - a plant asset
 - an investment
 - an intangible asset
6. Bonds Payable has a balance of \$2,000,000 and Discount on Bonds Payable has a balance of \$15,000. If the issuing corporation redeems the bonds at 99, what is the amount of gain or loss on redemption?
- \$20,000 loss
 - \$20,000 gain
 - \$5,000 gain
 - \$5,000 loss
7. On June 1, \$1,000,000 of bonds were purchased as a long-term investment at 99 plus accrued interest and \$1,000 was paid as the brokerage commission. If the bonds bear interest at 12%, which is paid semiannually on January 1 and July 1, what is the total cost to be debited to the investment account?
- \$1,100,000
 - \$1,000,000
 - \$991,000
 - \$990,000

8. The balance in Discount on Bonds Payable:
- should be reported on the balance sheet as an asset because it has a debit balance
 - would be subtracted from the related bonds payable on the balance sheet
 - would be added to the related bonds payable to determine the carrying amount of the bonds.
 - Should be allocated to the remaining periods for the life of the bonds by the straight-line method, if the results obtained by that method materially differ from the results that would be obtained by the interest method.
9. The journal entry a company records for the payment of interest, interest expense, and amortization of bond discount is:
- debit Interest Expense, credit Cash
 - debit Interest Expense and Discount on Bonds Payable, credit Cash
 - debit Interest Expense, credit Interest Payable and Discount on Bonds Payable
 - debit Interest Expense, credit Cash and Discount on Bonds Payable
10. The journal entry a company records for the payment of interest, interest expense, and amortization of bond premium is:
- debit Interest Expense, credit Cash
 - debit Interest Expense and Premium on bonds Payable, credit Cash
 - debit Interest Expense, credit Interest Payable and Premium on Bonds Payable
 - debit Interest Expense, credit Cash and Premium on Bonds Payable
11. \$100,000, 10-year, 9% Bonds that pay interest semiannually were issued when the market interest rate was 10%. The annual amortization of the Bond Discount using the straight-line method will be (Hint: First calculate the selling price of the bond):
- \$450.00
 - \$498.49
 - \$500.00
 - \$621.30
12. When a bond is sold at a premium it is reported on the balance sheet at it's
- Face value
 - Maturity value
 - Carrying value
 - Market value
13. Amortizing a bond discount
- Decreases bond interest expense.
 - Increases the carrying value of the bond.
 - Has no effect on the bond interest expense.
 - Decreases the maturity value of the bond.

Revised September 2007

14. On January 1, 2001, \$5,000,000, 10-year, 8% bonds were issued at \$5,150,000. Interest is paid each January 1 and July 1. If the straight-line method of amortization is used to amortize the premium, the amortization for the first year is:
- a. \$7,500
 - b. \$15,000
 - c. \$150,000
 - d. \$250,000
15. A 10%, 5-year, \$100,000 bond that sells when the market rate of interest is 12% will sell at
- a. face value
 - b. a premium
 - c. a discount
 - d. par
16. Bonds with a face value of \$2,000,000 are sold at 97. The entry to record the issuance is
- a. Debit Cash \$2,000,000; Credit Discount on Bonds Payable \$60,000 and Bonds Payable \$1,940,000
 - b. Debit Cash \$1,940,000; Credit Bonds Payable \$1,940,000
 - c. Debit Cash \$2,060,000; Credit Discount on Bonds Payable \$60,000 and Bonds Payable \$2,000,000
 - d. Debit Cash \$1,940,000 and Discount on Bonds Payable \$60,000; Credit Bonds Payable \$2,000,000
17. A \$500,000 bond liability is retired at 97 when the carrying value of the bond is \$483,000. The entry to record the retirement would include a
- a. \$2,000 loss
 - b. \$15,000 gain
 - c. \$15,000 loss
 - d. \$2,000 gain
18. Bonds with a face value of \$800,000 and interest rate of 8% are issued at 105 on January 2, 2002. The bonds pay interest semiannually on January 1 and July 1 and mature in 5 years. What is the total interest expense in 2002?
- a. \$32,000
 - b. \$56,000
 - c. \$64,000
 - d. \$72,000

Revised September 2007

19. The journal entry to amortize a discount on an investment in bonds includes a debit to:

- a. Interest Expense
- b. Interest Income
- c. Investment in Bonds
- d. Discount on Bonds Payable

20. An investment in bonds with a face value of \$300,000 is sold at 110 less brokerage commission of \$1,500. The current balance of the Investment in Bonds account is \$325,800. The gain or loss from this sale is:

- a. \$4,200 gain
- b. \$4,200 loss
- c. \$2,700 gain
- d. \$2,700 loss

SOLUTIONS TO PRACTICE PROBLEMS

Practice Problem #1

a) Annuity Factor
 4 periods at 12%
 \$8,000 X 3.03735 = \$24,298.80

b) Present Value of \$1
 10 periods at 9%
 \$400,000 X .42241 = \$168,964

 Present Value of \$1
 10 periods at 9%
 \$400,000 X .61391 = \$245,564

c) Annuity Factor
 20 periods at 9 %
 \$10,000 X 9.12855 = \$ 91,285.50

 Present Value of \$1
 20 periods at 9%
 \$200,000 X .17843 = \$ 35,686.00
 \$126,971.50

Practice Problem #2

1. Present Value of \$1
 14 periods at 6%
 \$8,000,000 X .44230 = \$3,538,400

 Annuity Factor
 14 periods at 6%
 \$360,000 X 9.29498 = \$3,346,193
 Selling Price of Bonds \$6,884,593

Cash	6,884,593	
Discount on Bonds Payable	1,115,407	
Bonds Payable		8,000,000

2. Interest Expense	360,000	
Cash		360,000

Practice Problem #3

2003

9/2	Cash	5,529,704	
	Premium on Bonds Payable		529,704
	Bonds Payable	5,000,000	
12/31	Interest Expense	250,000	
	Interest Payable		250,000
	<i>Accrued interest for 4 months: $5,000,000 * .15 * 4/12$</i>		
12/31	Premium on Bonds Payable	17,657	
	Interest Expense		17,657
	<i>Premium of $529,704/10 \text{ years} = 52,970 \text{ per year}$</i>		
	<i>$52,970 * 4/12 = 17,657$</i>		
12/31	Income Summary	232,343	
	Interest Expense		232,343

2004

1/1	Interest Payable	250,000	
	Interest Expense		250,000
3/1	Interest Expense	375,000	
	Cash		375,000
9/1	Interest Expense	375,000	
	Cash		375,000
12/31	Interest Expense	250,000	
	Interest Payable		250,000
12/31	Premium on Bonds Payable	52,970	
	Interest Expense		52,970
12/31	Income Summary	697,030	
	Interest Expense		697,030

2005

2/2	Bonds Payable	5,000,000	
	Premium on Bonds Payable	454,663	
	Cash		5,400,000
	Gain on Redemption		54,663

Practice Problem #4

2002

11/1	Investment in Bonds	461,600	
	Interest Income	20,000	
	Cash		481,600

12/31	Cash	30,000	
	Interest Income		30,000

12/31	Interest Income	880	
	Investment in Bonds		880

2008

6/30	Cash	30,000	
	Interest Income		30,000

8/31	Interest Income	1,320	
	Investment in Bonds		1,320

8/31	Cash	216,600*	
	Loss on Sale of Investment	4,240	
	Interest Income		5,000
	<i>(200,000 * .15 * 2/12)</i>		

	Investment in Bonds	215,840	
	<i>*200,000 * 106% = 212,000 + 5,000 interest – 400 commission</i>		

12/31	Cash	15,000	
	Interest Income		15,000

12/31	Interest Income	2,640	
	Investment in Bonds		2,640

SOLUTIONS TO MULTIPLE CHOICE QUESTIONS

1. D
2. B
3. B
4. D
5. C
6. C: Carrying Value = $2,000,000 - 15,000 \text{ discount} = 1,985,000$
 Redemption Price = $2,000,000 * 99\% = 1,980,000$
 Loss = 5,000
7. C: $1,000,000 * 99\% = 990,000 + 1,000 \text{ commission} = 991,000$
8. B
9. D: Interest Expense XXX
 Discount on B.P. XXX
 Cash XXX
10. B: Interest Expense XXX
 Premium on B.P. XXX
 Cash XXX
11. D Face Value: $100,000 * .37689 \text{ (20 per., 5\%)} = 37,689$
 Interest: $4,500 * 12.46221 \text{ (20 per., 5\%)} = 56,098$
 Selling Price = 93,787
 Discount = 6,213 Amortization = $6213/10 = 621.30$
12. C
13. B
14. B: $150,000/10 = 15,000$
15. C
16. D: Cash $1,940,000 = 2,000,000 * 97\%$
 Discount on B.P. 60,000
 Bonds Payable 2,000,000
17. A: Redemption Price = $500,000 * 97\% = 485,000$
 Carrying Value = 483,000
 Loss = 2,000
18. B: $800,000 * 8\% = 64,000 \text{ interest expense per year}$
 Less: Amortization of premium (5%) $40,000 / 5 \text{ years} = 8,000$
 Interest Expense = 56,000
19. C: Investment in Bonds XXX
 Interest Income XXX
20. C: $300,000 * 110\% = 330,000 - 1,500 \text{ commission} = 328,500$
 Less: Carrying Value 325,800
 Gain on Sale of Investment 2,700