8. Accounting for Bonds Payable

Cash Flow facts 8% stated rate

A bond payable is just a promise to pay a stream of payments over time (the interest component), and a fixed amount at maturity (the face amount). Thus, it is a blend of an annuity (the interest) and lump sum payment (the face). To determine the amount an investor will pay for a bond, therefore, requires some present value computations to determine the current worth of the future payments.

To illustrate, let's assume that Schultz Company issues 5-year, 8% bonds. Bonds frequently have a $1,000 face value, and pay interest every six months. To be realistic, let's hold to these assumptions.

Par scenario Market rate of 8%

If 8% is the market rate of interest for companies like Schultz (i.e., companies having the same perceived integrity and risk), when Schultz issues its 8% bonds, then Schultz's bonds should sell at face value (also known as "par" or "100"). That is to say, investors will pay $1,000 for a bond and get back $40 every six months ($80 per year, or 8% of $1,000). At maturity they will also get their $1,000 investment back. Thus, the return on the investment will equate to 8%.

Premium scenario Market rate of 6%

On the other hand, if the market rate is only 6%, then the Schultz bonds look pretty good because of their higher stated 8% interest rate. This higher rate will induce investors to pay a premium for the Schultz bonds. But, how much more will they pay? The answer to this question is that they will bid up the price to the point that the effective yield (in contrast to the stated rate of interest) drops to only equal the going market rate of 6%. Thus investors will pay more than $1,000 to gain access to the $40 interest payments every six months and the $1,000 payment at maturity. The exact amount they will pay is determined by discounting (i.e., calculating the present value) the stream of payments at the market rate of interest. This calculation is demonstrated below, followed by an additional explanation.

Discount scenario Market rate of 10%

Also, consider the alternative scenario. If the market rate is 10% when the 8% Schultz bonds are issued, then no one would want the 8% bonds unless they can be bought at a discount. How much discount would it take to get you to buy the bonds? The discount would have to be large enough so that the effective yield on the initial investment would be pushed up to 10%. That is to say, your price for the bonds would be low enough so that the $40 periodic payment and the $1,000 at maturity would give you the requisite 10% market rate of return. The exact amount is again determined by discounting (i.e., calculating the present value) the stream of payments at the market rate of interest.

The table below calculates the price under the three different assumed market rate scenarios:

CASH FLOW FACTS 8% STATED RATE		PAR SCENARIO MARKET RATE OF 8%		PREMIUM SCENARIO MARKET RATE OF 6%		DISCOUNT SCENARIO MARKET RATE OF 10%	
Payment	Amount	Present Value Factors at 4%, 10 Periods	Present Value (amount X factor)	Present Value Factors at 3%, 10 Periods	Present Value (amount X factor)	Present Value Factors at 5%, 10 Periods	Present Value (amount X factor)
Periodic Interest	$40.00*	8.11090	$324.44	8.53020	$341.21	7.72173	$308.87
Maturity Value	$1,000.00	0.67556	$675.56	0.74409	$744.09	0.61391	$613.91
			$1,000.00		**$1,085.30**		**$922.78**

To further explain, the interest amount on the $1,000, 8% bond is $40 every six months. Since the bonds have a 5-year life, there are 10 interest payments (or periods). The periodic interest is an annuity with a 10-period duration, while the maturity value is a lump-sum payment at the end of the tenth period. The 8% market rate of interest equates to a semiannual rate of 4%, the 6% market rate scenario equates to a 3% semiannual rate, and the 10% rate is obviously 5% per semiannual period. The present value factors are taken from the present value tables (annuity and lump-sum, respectively). You should take time to trace the factors to the appropriate tables. The present value factors are multiplied times the payment amounts, and the sum of the present value of the components would equal the price of the bond under each of the three scenarios. Note that the 8% market rate assumption produced a bond priced at $1,000, the 6% assumption produced a bond priced at $1,085.30 (which includes an $85.30 premium), and the 10% assumption produced a bond priced at $922.78 (which includes a $77.22 discount).

These calculations are not only correct theoretically, but you will find that they are very accurate financial tools -- reality will emulate theory. But, one point is noteworthy. Bond pricing is frequently done to the nearest 1/32nd. That is, a bond might trade at 103.08. You could easily misinterpret this price as $1,030.80. But, it actually means 103 and 8/32. In dollars, this would come to $1,032.50 ($1,000 X 103.25). So, now you should understand the theory and mechanics of how a bond is priced. It is time to examine the correct accounting.

8.1 Bond Issued at Par

If Schultz issued 100 of its bonds at par, the following entries would be required, and probably require no additional explanation:

1-1-X1	Cash		100,000	
	Bonds Payable			100,000
	To record issuance of 100, 8%, 5-year bonds at par (100 X $1,000 each)			
periodically	Interest Expense		4,000	
	Cash			4,000
	To record interest payment (this entry occurs on every interest payment date at 6 month intervals -- $100,000 X 8% X 6/12)			
12-31-X5	Bonds Payable		100,000	
	Cash			100,000
	To record payment of face value at maturity			

8.2 Bond Issued at Premium

You will likely need to reread this paragraph several times before it really starts to sink in. One very simple way to consider bonds issued at a premium is to reduce accounting to its simplest logic - - counting money! If Schultz issues 100 of the 8%, 5-year bonds when the market rate of interest is only 6%, then the cash received is $108,530 (see the previous discussion for the related calculations). Schultz will have to repay a total of $140,000 ($4,000 every 6 months for 5 years, plus $100,000 at maturity). Thus, Schultz will repay $31,470 more than was borrowed ($140,000 - $108,530). This $31,470 must be expensed over the life of the bond; uniformly spreading the $31,470 over 10 six month periods produces periodic interest expense of $3,147 (do not confuse this amount with the cash payment of $4,000 that must be paid every six months!). Another way to consider this problem is to note that total borrowing cost is reduced by the $8,530 premium, since less is to be repaid at maturity than was borrowed up front. Therefore, the $4,000 periodic interest payment is reduced by $853 of premium amortization each period ($8,530 premium amortized on a straight line basis over the 10 periods), producing the periodic interest expense of $3,147 ($4,000 - $853)!

This topic is inherently confusing, and the journal entries are actually helpful in clarifying your understanding. As you look at these entries, notice that the premium on bonds payable is carried in a separate account (unlike accounting for investments in bonds covered in a prior chapter, where the premium was simply included with the Investment in Bonds account).

1-1-X1	Cash		108,530	
	Premium on Bonds Payable			8,530
	Bonds Payable			100,000
	To record issuance of 100, 8%, 5-year bonds at premium			
periodically	Interest Expense		3,147	
	Premium on Bonds Payable		853	
	Cash			4,000
	To record interest payment (this entry occurs on every interest payment date at 6 month intervals) and amortization of premium			
12-31-X5	Bonds Payable		100,000	
	Cash			100,000
	To record payment of face value at maturity			

By carefully studying the following illustration you will observe that the Premium on Bonds Payable is established at $8,530, then reduced by $853 every interest date, bringing the final balance to zero at maturity.

Period Ending	Bonds Payable	Unamortized Premium	Net Book Value (Bonds Payable plus Unamortized Premium)	Interest Expense (Cash Paid less Premium Amortization)
	$ 100,000	$ 8,530	$ 108,530	
6-30-X1	100,000	7,677	107,677	$ 3,147
12-31-X1	100,000	6,824	106,824	3,147
6-30-X2	100,000	5,971	105,971	3,147
12-31-X2	100,000	5,118	105,118	3,147
6-30-X3	100,000	4,265	104,265	3,147
12-31-X3	100,000	3,412	103,412	3,147
6-30-X4	100,000	2,559	102,559	3,147
12-31-X4	100,000	1,706	101,706	3,147
6-30-X5	100,000	853	100,853	3,147
12-31-X5	100,000	0	100,000	3,147

On any given financial statement date, Bonds Payable is reported on the balance sheet as a liability, along with the unamortized Premium appended thereto (known as an "adjunct" account). To illustrate, the balance sheet disclosure as of 12-31-X3 would appear as follows:

Long-term Liabilities		
Bonds payable	$ 100,000	
Plus: Unamortized premium on bonds payable	3,412	$ 103,412

The income statement for all of 20X3 would include $6,294 of interest expense ($3,147 X 2). This method of accounting for bonds issued at a premium is known as the straight-line amortization method, as interest expense is recognized uniformly over the life of the bond. The technique offers the benefit of simplicity, but it does have one conceptual shortcoming. Notice that interest expense is the same each year, even though the net book value of the bond (bond plus remaining premium) is declining each year due to amortization. As a result, interest expense each year is not exactly equal to the effective rate of interest (6%) that was implicit in the pricing of the bonds. For 20X1, interest expense can be seen to be roughly 5.8% of the bond liability ($6,294 expense divided by beginning of year liability of $108,530). For 20X4, interest expense is roughly 6.1% ($6,294 expense divided by beginning of year liability of $103,412). Accountants have devised a more precise approach to account for bond issues called the effective interest method. Be aware that the more theoretically correct effective interest method is actually the required method, except in those cases where the straight-line results do not differ materially. Effective-interest techniques are introduced in a following section of this chapter

8.3 Bond Issued at a Discount

If Schultz issues 100 of the 8%, 5-year bonds for $92,278 (when the market rate of interest is 10% -- see the previous discussion for exact calculations), Schultz will still have to repay a total of $140,000 ($4,000 every 6 months for 5 years, plus $100,000 at maturity). Thus, Schultz will repay $47,722 ($140,000 - $92,278) more than was borrowed. This $47,722 must be expensed over the life of the bond; spreading the $47,722 over 10 six-month periods produces periodic interest expense of $4,772.20 (do not confuse this amount with the cash payment of $4,000 that must be paid every six months!). Another way to consider this problem is to note that the total borrowing cost is increased by the $7,722 discount, since more is to be repaid at maturity than was borrowed upfront. Therefore, the $4,000 periodic interest payment is increased by $772.20 of discount amortization each period ($7,722 discount amortized on a straight line basis over the 10 periods), producing periodic interest expense that totals $4,772.20!

Now, let's look at the entries for the bonds issued at a discount. Like bond premiums, discounts are also carried in a separate account.

1-1-X1	Cash		92,278	
	Discount on Bonds Payable		7,722	
	Bonds Payable			100,000
	To record issuance of 100, 8%, 5-year bonds at discount			
periodically	Interest Expense		4,772	
	Discount on Bonds Payable			772
	Cash			4,000
	To record interest payment (this entry occurs on every interest payment date at 6 month intervals) and amortization of discount			
12-31-X5	Bonds Payable		100,000	
	Cash			100,000
	To record payment of face value at maturity			

By carefully studying this illustration, you will observe that the Discount on Bonds Payable is established at $7,722, then reduced by $772.20 on every interest date, bringing the final balance to zero at maturity. On any given financial statement date, Bonds Payable is reported on the balance sheet as a liability, along with the unamortized Discount that is subtracted (known as a "contra" account). The illustration below shows the balance sheet disclosure as of June 30, 20X3. Note that the unamortized discount on this date is determined by calculations revealed in the table that follows:

Long-term Liabilities		
Bonds payable	$ 100,000	
Less: Unamortized discount on bonds payable	(3,861)	$ 96,139

Period Ending	Bonds Payable	Unamortized Discount	Net Book Value (Bonds Payable less Unamortized Discount)	Interest Expense (Cash Paid plus Discount Amortization)
	$ 100,000.00	$ 7,722.00	$ 92,278.00	
6-30-X1	100,000.00	6,949.80	93,050.20	$ 4,772.20
12-31-X1	100,000.00	6,177.60	93,822.40	4,772.20
6-30-X2	100,000.00	5,405.40	94,594.60	4,772.20
12-31-X2	100,000.00	4,633.20	95,366.80	4,772.20
6-30-X3	100,000.00	3,861.00	96,139.00	4,772.20
12-31-X3	100,000.00	3,088.80	96,911.20	4,772.20
6-30-X4	100,000.00	2,316.60	97,683.40	4,772.20
12-31-X4	100,000.00	1,544.40	98,455.60	4,772.20
6-30-X5	100,000.00	772.20	99,227.80	4,772.20
12-31-X5	100,000.00	0	100,000.00	4,772.20

The income statement for each year would include $9,544.40 of interest expense ($4,772.20 X 2) under this straight-line approach. It again suffers from the same theoretical limitations that were discussed for the straight-line premium example. But, it is an acceptable approach if the results are not materially different from those that would result with the effective-interest amortization technique.