

## **Effects of debt issuance and amortization on the income statement, balance sheet, and cash flow statement**

### **Current Liability**

Current liabilities are defined as those due within one year or the operating cycle whichever is longer; they result from both operating and financing activities. Analysis must distinguish among different types of current operating and financing liabilities:

#### **Consequences of Operating Activities**

- **Operating and trade liabilities**, the most frequent type, are the result of credit granted to the company by its suppliers and employees.
- **Advances from customers** arise when customers pay in advance for services to be rendered by the company. The firm is obligated to render the service and / or deliver a product to the customer in the near future.

#### **Consequences of Financing Activities**

- **Short-term debt** represents amounts borrowed from banks or the credit markets that are expected to be repaid within one year or less.
- **Current portion of long-term debt** identifies the portion of long-term debt that is payable within the next year; it is excluded from the long-term liability section of the balance sheet.

**Operating and trade debt is reported at the expected (undiscounted) cash flow and is an important exception to the rule that liabilities are recorded at present value.**

When analyzing a firm's liquidity, advances from customers should be distinguished from other payables. Payables require a future outlay of cash. Advances from customers, on the other hand, are satisfied by delivery of goods or services, requiring a cash outlay lower than the advances recorded; otherwise, the firm would be selling below cost. **Increases in advances should be viewed favorably as advances are a prediction of future revenues rather than cash outflows.**

**A shift from operating to financing liabilities may signal the beginning of a liquidity crisis.**

### **Long-Term Debt**

**Long-term liabilities are interest-bearing in nature, but the structure of interest and principal payments varies widely.**

- **Debt equals the present value of the remaining future stream of (interest and principal) payments. The book value reported in the financial statements uses the discount rate (market interest rate) in effect when the debt was incurred.** Market value measurements for analytical purposes use the current market interest rate.
- **Interest expense is the amount paid by the debtor to the creditor in excess of the amount borrowed.** The total amount of interest paid over time is known; its allocation to individual time periods (both cash outflows and accrual of expense in periodic income statements) may vary.

## Financial Statement Effects of Issuing a Bond

### Statement of Cash Flow

	<i>Cash Flow from Financing</i>	<i>Cash Flow from Operations</i>
Issuance of debt	Increased by cash received (Present value of the bond at the market interest rate)	No effect
Periodic interest payments	No effect	Decreased by interest paid [(coupon rate)(face or par value)]
Payment at maturity	Decreased by face (par) value	No effect

### Income Statement

Interest expense = the market rate at issue times the balance sheet value of the liability at the beginning of the period.

<i>Issued at Par</i>	<i>Issued at a Premium</i>	<i>Issued at a Discount</i>
Market rate = face rate	Market rate < face rate	Market rate > face rate
Interest expense = face rate times face value = cash paid	Interest expense = cash paid – amortization of premium	Interest expense = cash paid + amortization of discount
Interest is constant	Interest decreases over time.	Interest increases over time

### Balance Sheet

Long-term debt is carried at the present value of the remaining cash payments discounted at the market rate existing when the debt was issued.

<i>Issued at Par</i>	<i>Issued at a Premium</i>	<i>Issued at a Discount</i>
Carried at face value	Carried at face value plus premium.	Carried at face value less discount.
	The liability decreases as the premium is amortized to interest expense.	The liability increases as the discount is amortized to interest expense.

<sup>1</sup> Schweser, 2002, page 212.

## Example: Effective Interest Method for Amortization of a Premium

To illustrate amortization of a premium, Evermaster Corporation issued 100'000.00 of 8% term bonds on January 1, 1998, due on January 1, 2003, with interest payable each July 1 and January 1. Because the investors required an effective interest rate of 6% (market rate at issue), they paid 108'530.20 for the 100'000.00 of bonds, creating a 8'530.20 premium.

### Calculation of Premium

PV (Present Value) of the bond at market interest rate:

<b>PV ?</b>	<b>given:</b>	<b>108'530.20</b>
FV (Future Value): face value due on January 1, 2003		-100'000.00
PMT (equal Payment amounts): 10 times semiannually at 4% (8%/2)		-4'000.00
Payment Mode = End		
n (Number of times):		10
i (Interest): market rate at issue (semiannually: 6%/2)		3%

### Premium

Present Value minus Face Value	<b>8'530.20</b>
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Journal bookings on January 1, 1998:

Cash	108'530.20
Premium on Bonds Payable	8'530.20
Bonds Payable	100'000.00

### Schedule of Bond Premium Amortization

<u>Date</u>	<u>Cash Paid</u> (Coupon Payment)	<u>Interest</u> <u>Expense</u>	<u>Premium</u> <u>Amortization</u>	<u>Net Carrying</u> <u>Amount</u> <u>'Bond'</u>
1/1/98				108'530.20
7/1/98	4'000.00	3'255.91	744.09	107'786.11
1/1/99	4'000.00	3'233.58	766.42	107'019.69
7/1/99	4'000.00	3'210.59	789.41	106'230.28
1/1/00	4'000.00	3'186.91	813.09	105'417.19
7/1/00	4'000.00	3'162.52	837.48	104'579.71
1/1/01	4'000.00	3'137.39	862.61	103'717.10
7/1/01	4'000.00	3'111.51	888.49	102'828.61
1/1/02	4'000.00	3'084.86	915.14	101'913.47
7/1/02	4'000.00	3'057.40	942.60	100'970.87
1/1/03	<u>4'000.00</u>	<u>3'029.13</u>	<u>970.87</u>	<u>100'000.00</u>
Total	40'000.00	31'469.80	8'530.20	

Journal bookings on e.g., July 1, 1999:

Bond Interest Expense	3'210.59
Premium on Bonds Payable	789.41
Cash	4'000.00

Journal bookings on e.g., December 31, 2003:

Bond Interest Expense	3'029.13
Premium on Bonds Payable	970.87
Bond Interest Payable (BS)	4'000.00

Journal bookings on January 1, 2003

Bond Interest Payable (BS)	4'000.00
Cash	4'000.00
Bonds Payable	100'000.00
Cash	100'000.00

## **Effect on reported cash flows of issuing zero-coupon debt**

A zero-coupon bond has no periodic payments (coupon = 0). For that reason, it must be issued at a deep discount to face value. The lump-sum payment at maturity includes all unpaid interest (equal to the face value minus the proceeds) from the time of issuance.

The proceeds at issuance equal the present value of the face amount, discounted at the market interest rate.

**The interest on a zero-coupon bond never reduces operating cash flow.<sup>2</sup>**

This surprising result has important analytic consequences:

- **Reported CFO is systematically "overstated"** when a zero-coupon (or deep discount) bond is issued;
- **Solvency ratios**, such as cash-basis interest coverage, **are improved** relative to the issuance of par bonds;
- **Cash eventually required to repay** the obligation may become a significant **burden**.

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<sup>2</sup> In fact, interest expense increases cash flow by generating income tax deductions. (Zero-coupon bond interest is tax-deductible even though it is not paid.)

## Example: Effective Interest Method for Zero-Coupon Debt

To illustrate amortization of a Zero-Coupon Debt discount, Evermaster Corporation issued 100'000.00 (Face Value) of a zero-coupon bonds on January 1, 1998, due on January 1, 2008. Because the investors required an effective interest rate of 5% (market rate at issue), they paid 61'391.33 for the 100'000.00 of zero-coupon bonds, creating a 38'608.67 discount.

### Calculation of Discount

PV (Present Value) of the bond at market interest rate:

<b>PV ?</b>	<b>given:</b>	<b>61'391.33</b>
FV (Future Value): face value due on January 1, 2008		-100'000.00
PMT (equal Payment amounts):		0.00
Payment Mode = End		
n (Number of times):		10
i (Interest): market rate at issue		5%

### Discount

Face Value minus Present Value	<b>38'608.67</b>
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Journal bookings on January 1, 1998:

Cash	61'391.33
Discount on Zero-Coupon Bonds Payable	38'608.67
Zero-Coupon Bonds Payable	100'000.00

### Schedule of Bond Discount Amortization

<u>Date</u>	<u>Cash Paid</u> (Coupon Payment)	<u>Interest</u> <u>Expense</u>	<u>Discount on</u> <u>Zero-Coupon</u> <u>Amortization</u>	<u>Net Carrying</u> <u>Amount</u> <u>'Zero-Bond'</u>
1/1/98				61'391.33
1/1/99	0.00	3'069.57	3'069.57	64'460.89
1/1/00	0.00	3'223.04	3'223.04	67'683.94
1/1/01	0.00	3'384.20	3'384.20	71'068.13
1/1/02	0.00	3'553.41	3'553.41	74'621.54
1/1/03	0.00	3'731.08	3'731.08	78'352.62
1/1/04	0.00	3'917.63	3'917.63	82'270.25
1/1/05	0.00	4'113.51	4'113.51	86'383.76
1/1/06	0.00	4'319.19	4'319.19	90'702.95
1/1/07	0.00	4'535.15	4'535.15	95'238.10
1/1/08	<u>0.00</u>	<u>4'761.90</u>	<u>4'761.90</u>	<u>100'000.00</u>
Total	0.00	38'608.67	38'608.67	

Journal bookings on e.g., January 1, 2001:

Zero-Coupon Bonds Interest Expense	3'384.20
Discount on Zero-Coupon Bonds Payable	3'384.20
Cash	0.00

Journal bookings on e.g., December 31, 2008:

Zero-Coupon Bonds Interest Expense	4'761.90
Discount on Zero-Coupon Bonds Payable	4'761.90
Zero-Coupon Bond Interest Payable (BS)	0.00

Journal bookings on January 1, 2008

Zero-Coupon Bond Interest Payable (BS)	0.00
Cash	0.00
Zero-Coupon Bonds Payable	100'000.00
Cash	100'000.00

## **LEASES**

### ***Classification of a lease as capital or operating***

#### **Incentive for Leasing**

**Short-term, or operating, leases** allow the lessee to use leased property for only a portion of its economic life. The **lessee accounts for such leases as contracts reporting (as rental expense) only the required rental payments as they are made.** Because the lessor retains substantially all the risks of ownership of leased property, the leased **assets remain on its balance sheet and are depreciated over their estimated economic lives, rental payments are recognized as revenues** over time according to the terms of the lease.

Alternatively, **longer-term leases** may effectively transfer all (or substantially all) the risks and rewards of the leased property to the lessee. **Such leases are the economic equivalent of sales with financing arrangements** designed to effect the purchase (by the lessee) and sale (by the lessor) of the leased property. Such leases, referred to as **finance or capital leases**, are treated for accounting purposes as sales. The **asset and associated debt are carried on the books of the lessee, and the lessor records a gain on "sale" at the inception of the lease. The lessee depreciates the asset over its life, and treats lease payments as (re)payments of principal and interest.**

**The financial reporting differences between accounting for a lease as an operating or capital lease are far-reaching** and affect the balance sheet, income statement, cash flow statement, and associated ratios.

#### **Capital (Financing) Lease**

A lease that, in economic substance, transfers to the lessee substantially all the risks and rewards inherent in the leased property is a financing or capital lease and should be capitalized.

**A lease (noncancelable) meeting one or all of the following SFAS 13 criteria at the inception of the lease must be classified as a capital lease by lessees:**

- The **lease transfers ownership of the property to the lessee at the end of the lease term;**
- The **lease contains a bargain purchase option;**
- The **lease term is equal to 75% or more of the estimated economic life of the leased property** (not applicable to land or when the lease term begins within the final 25% of the economic life of the asset);
- The **present value<sup>3</sup> of the minimum lease payments equals or exceeds 90% of the fair value of leased property** to the lessor.

#### **Operating Lease**

**Leases not meeting any of the four criteria listed above are not capitalized** and no asset or obligation is reported in the financial statements since no purchase is deemed to have occurred. **Such leases are classified as operating leases, and payments are reported as rental expense.**

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<sup>3</sup> **'The discount rate used to compute the present values should be the lessee's incremental borrowing rate or the implicit interest rate of the lessor, whichever is lower.** The use of the lower rate generates the higher of two present values, increasing the probability that this criterion will be met and the lease capitalized.



## Effects of capital and operating leases on financial statements and ratios

### Example: Capital Lease Method (Lessee)

Lessor Company and Lessee Company sign a lease agreement dated January 1, 1999, that calls for Lessor Company to lease equipment to Lessee Company beginning January 1, 1999. The terms and provisions of the lease agreement and other pertinent data are as follows:

- The term of the lease is 5 years, and the lease agreement is noncancelable, requiring equal rental payments of 23'981.59 at the beginning of each year (annuity due basis).
- The equipment has a fair value at the inception of the lease of 100'000.00, an estimated economic life of 5 years, and no residual value.
- The lease contains no renewal options, and the equipment reverts to Lessor Company at the termination of the lease.
- Lessee Company's incremental borrowing rate is 11% per year.
- Lessee Company depreciates on a straight-line basis similar equipment that it owns.
- Lessor Company set the annual rental to earn a rate of return on its investment of 10% per year; this fact is known to Lessee Company.

### Calculation of Capitalized Lease Payments

PV (Present Value) of the bond at market interest rate:

<b>PV ?</b>	<b>given:</b>	<b>100'000.00</b>
FV (Future Value): equipment reverts to Lessor on December 31, 2003		0.00
PMT (equal Payment amounts): equal rental payments		-23'981.59
Payment Mode = <b>Begin</b> = Annuity due basis		
n (Number of times): number of equal rental payments		5
i (Interest): lessor's implicit interest rate: 10%		10%

Journal bookings on January 1, 1999:

Leased Equipment under Capital Lease	100'000.00
Obligations under Capital Lease	100'000.00

### Lease Amortization Schedule (Annuity due basis)

<u>Date</u>	<u>Annual Lease Payment)</u>	<u>Interest Expense</u>	<u>Reduction of Lease Obligation</u>	<u>Lease Obligation</u>
1/1/99				100'000.00
1/1/99	23'981.59	-	23'981.59	76'018.41
1/1/00	23'981.59	7'601.84	16'379.75	59'638.66
1/1/01	23'981.59	5'963.87	18'017.72	41'620.94
1/1/02	23'981.59	4'162.09	19'819.50	21'801.45
1/1/03	<u>23'981.59</u>	<u>2'180.14</u>	<u>21'801.45</u>	<u>0.00</u>
Total	119'907.95	19'907.95	100'000.00	

Journal bookings on e.g., December 31, 2000:

Interest Expense	5'963.87
Interest Payables	5'963.87
Depreciation Expense - Capital Lease (IS)	20'000.00
Accumulated Depreciation - Capital Lease (BS)	20'000.00

Journal bookings on e.g., January 1, 2001:

Obligations under Capital Lease	18'017.72
Interest Payables	5'963.87
Cash	23'981.59

Balance Sheet on e.g., December 31, 2000:

*Current Liabilities*

Interest Payables	5'963.87
Obligations under Capital Lease	18'017.72

*Long-term Liabilities*

Obligations under Capital Lease	41'620.94
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Capital (Financing) Lease Effects on ...

Balance Sheet: At the inception of the lease, **an asset and a liability equal to the present value of the lease payments are recognized**. The **gross and net (of accumulated depreciation) assets** are reported at each balance sheet date. The **current and noncurrent components of the lease obligation** are reported as liabilities.

Financial Ratios:

- Lease capitalization increases asset balances, resulting in **lower asset turnover and return on asset ratios**.
- Lease capitalization adds both current and noncurrent liabilities to debt, resulting in a corresponding **decrease in working capital and increases in the debt-to-equity and other leverage ratios**.

Income Statement: Lease capitalization **recognizes depreciation and interest expense over the estimated service life and lease term**.

- Lease capitalization results in **higher** operating income, since interest expense is not included in **EBIT**.
- Although total net income over the lease term is not affected by capitalization, the timing of income recognition is changed; **lower net income is reported in the early years, followed by higher income in later years**. This is because lease capitalization expense includes interest expense (high in the early years) and depreciation of the leased asset.

Cash Flow: Lease capitalization results in both operating financing cash flows as the 'rental' payments are allocated between interest expense (treated as CFO) and amortization of the lease obligation (reported as cash from financing). Because interest expense declines over the lease term and an increasing proportion of the annual payment is allocated to the lease obligation, the difference in CFO increases over the lease term.

- Thus, **lease capitalization systematically decreases the operating cash outflow while increasing the financing cash outflow**.

### **Operating Lease Effects on ...**

**Balance Sheet:** **No assets or liabilities are recognized** if the lease is treated as an operating lease.

**Financial Ratios:**

- **Leverage ratios are understated**, since 'operating lease obligations' are not recognized as a liability for operating leases.
- In general, firms with operating leases report **higher profitability, interest coverage (as interest expense is lower), return on equity, and return on assets ratios**. The higher ROE ratios are due to the higher profitability (numerator effect), whereas the higher ROA is due primarily to the lower assets (denominator effect).

**Income Statement:** The operating lease **method charges the periodic rental payments to expense as accrued**.

**Cash Flow:** Under the operating lease method, **all cash flows (regarding the lease) are operating**.

### ***Factors that determine whether a company would tend to favor capital (financing) or operating leases***

Capital lease method negatively affects some financial statement ratios, such as profitability, interest coverage (because interest expense is higher), return on equity, return on asset ratios. However, it permits firms to report higher operating cash flows, as compared to those cash flows reported using the operating lease method.

Companies typically **prefer operating leases** over capital leases because they:

- **Reduce the amount of debt shown, and therefore improve leverage ratios;**
- **Improve turnover ratios** because fewer assets are shown;
- **Improve profitability in the early years of the lease.**

## Liabilities for Asset Retirement Obligation (ARO)

### Meaning and Requirements of SFAS 143

Governments often require that owners of operating assets remedy the environmental damage caused by operating those assets or restore land to its preexisting condition. Common examples include:

- Restoration of strip **mines** after mining is completed
- Dismantlement of an **offshore oil platform** after the end of its useful life
- Removal of **toxic wastes** caused by production
- **Decontamination** of site when a **nuclear power plant** is decommissioned

Prior to SFAS 143, current period costs of these activities were often expensed except for capital expenditures that were capitalized. In some cases the accrual of an asset retirement obligation was required. In these cases ARO was recognized over the life of the asset and measured using a cost-accumulation approach: it was not discounted, and was often recorded as a contra asset with no recognition of a separate liability. In addition many electricity producers accrued for the decontamination of nuclear facilities.

As no standards have existed for the accrual of future expenditures, practice has been inconsistent.

The requirements of SFAS 143 (2002) are:

- **It applies to all entities and to all legal obligations** (including contractual obligations) connected with the retirement of tangible fixed assets.
- Affected firms **must recognize the fair value of an ARO liability in the period in which it is incurred** (normally at acquisition).
- **Absent a market value, fair value is the present value of the expected cash flows required to extinguish the liability.**

#### Measurement of ARO liabilities:

- **Estimate the expected (gross) cash flows** required to extinguish the obligation, assuming an outside contractor is hired. Given uncertainty regarding future costs, the firm uses the expected value.
- The **present value of the expected cash flows** is computed using an interest rate based on the risk-free rate, but increased to reflect the credit risk of the firm (**credit-adjusted risk-free rate**).
- The resulting measure of the **ARO** is recognized **on the balance sheet as a liability, with periodic increases (using the effective interest method)** so that the liability equals the expected gross cash outflows at the expected payment date.
- As the liability is carried at its present value, **the firm must recognize accretion expense (out of the increase of the ARO liability) in its income statement each period. Accretion expense is classified separately in the operating section of the statement of income**, is not combined with interest expense, and is not considered interest cost.
- **An equal amount is added to the carrying basis of the related asset and depreciated over that asset's useful life**, using the same method used to depreciate the cost of the asset.
- Changes in the estimated liability are accounted for prospectively; prior **period amounts are not restated**.

- Required disclosures include:
  - Description of the ARO and associated asset
  - Reconciliation of the ARO liability, showing the effect of: new liabilities incurred; liabilities extinguished; accretion expense, and revisions of the estimated AROs.
  - Fair value of any restricted assets (such as funds) set aside for ARO obligations.

### **Effects of SFAS 143**

Implementation of the new standard will result in the following financial statement effects for most firms<sup>4</sup>:

- **Increase** in the carrying value of **fixed assets**.
- **Increase in liabilities** due to recognition of the ARO.
- **Lower net income** due to recognition of additional **depreciation** (higher fixed assets) and **accretion expense** (out of the increase of the ARO liability). Due to the nature of the accretion process, this operating expense will increase every year.

The following ratio effects will also occur:

- **Lower asset turnover** (higher asset levels)
- **Lower debt-to-equity ratio** as equity is depressed by lower net income.
- **Lower return on assets** (lower income, higher assets)
- **Lower interest coverage** (lower income due to higher depreciation and higher (accretion) expense)

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<sup>4</sup> For firms that have already recognized ARO liabilities (based on expected gross cash outflows), it is possible that the ARO liability will decrease under SFAS 143 because that standard measures the ARO at its present value.