

LONG TERM LIABILITIES AND LEASES

FINANCING LIABILITIES: Terminology

A **bond** is a contract between a borrower and a lender that obligates the borrower to make payments to the lender over the term of the bond. Two types of payments are usually involved—periodic interest payments and principal repayments. Before we get into the analysis of financing liabilities, we must understand the following terms:

Par or face value: This is the amount that the borrower must pay back investors at maturity. The par value is not necessarily the amount that the borrower receives upon issuing debt.

Coupon rate: This is multiplied by the par value of the bond to determine the periodic coupon payment.

Market interest rates are used to value bonds. These rates incorporate various types of risks inherent in the bond, and must not be confused with coupon rates. Market interest rates change from day to day.

The value of a company's debt obligations at any point in time equals the present value of all remaining payments discounted at current market interest rates (mi_t). However, for accounting purposes, the book value of the liability recognized on the issuer's balance sheet equals the present value of its obligations discounted at **market interest rates at issuance** (mi_0). Market interest rates at issuance determine how much the company receives in bond proceeds from the issuance of bonds.

At issuance, the market rate can be the same as, or different from the coupon rate.

- If the market interest rate is the *same* as the bond's coupon rate, the bond will be issued at *par*.
- If the market interest rate is *greater* than the coupon rate, the bond will be issued at a *discount*. Since the coupon rate on offer is *less* than the compensation required by market participants, the bond will sell at a discount.
- If the market interest rate is *lower* than the coupon rate, the bond will be issued at a *premium*. Since the coupon rate on offer *exceeds* the compensation required by the market, the bond will sell at a premium.

Finally, **interest expense** (recognized on the income statement) for a given period is calculated as the book value of the liability at the beginning of the period multiplied by the market interest rate at issuance (mi_0). It is **not** the coupon payment (actual periodic cash outflow) that is recognized as interest expense on the income statement.

Formulas

Bond proceeds at issuance ($t = 0$):
 $BV_0 = PV$ (cash flows) discounted at mi_0

Market value of bonds at time, t :
 PV (cash flows) discounted at mi_t

Coupon payment:
 Periodic coupon rate
 \times Par value

Interest expense:
 $mi_t \times$ Book value of liability at the beginning of the period.

LOS 39a: Compute the effects of debt issuance and amortization of bond discounts and premiums on financial statements and ratios. Vol 3, pg 515-524

We will work with the following example as we illustrate this LOS.

Alan Company plans to issue bonds worth \$100,000 par with a 10% annual coupon and a 4 year maturity. The amount of bond proceeds received by the company depends on market interest rates at issuance. We will work with three scenarios to illustrate the differences in accounting and analysis of par bonds, premium bonds and discount bonds.

Scenario A: Market Interest Rates at Issuance = 10%

The amount of bond proceeds equals the present value of the bond's cash flows discounted at market interest rates at issuance (10%).

FV = \$100,000; N = 4; I/Y = 10; PMT = \$10,000; CPT PV; PV → -\$100,000

Cash flows from bonds:

- Alan will receive \$100,000 for these bonds today.
- Alan will pay an annual coupon of \$10,000 for 4 years.
- At the end of Year 4, Alan will return the par value (\$100,000) to investors.

Interest Expense and Book Value of Par Bond

Year	Beginning Liability \$	Interest Expense \$	Coupon Payment \$	Change in Liability \$	Closing Liability \$
0				0	100,000
1	100,000	10,000	10,000	0	100,000
2	100,000	10,000	10,000	0	100,000
3	100,000	10,000	10,000	0	100,000
4	100,000	10,000	10,000	0	100,000
Total		40,000	40,000		

Market interest rate at issuance times beginning liability	Coupon rate times the par value	Interest expense minus coupon
↑	↑	↑

Effects on Financial Statements

Balance sheet: The year end value of the liability is listed on the balance sheet. For bonds issued at par, the liability balance remains at par throughout the life of the bond. (\$100,000 every year).

Income statement: Interest expense is deducted from operating income. For bonds issued at par, interest expense *equals* the coupon payment, and is constant over the life of the bond (\$10,000 every year).

Statement of cash flows:

- At issuance, bond proceeds are reported as inflows from *financing activities*.
- During the tenure of the bond, coupon payments (not interest expense) are deducted from *cash flow from operating activities*.
- At maturity, cash used to repay the principal amount (par value) is deducted from *cash flow from financing activities*.

For bonds issued at par, the inflows recorded at issuance under CFF equal the outflows from CFF at maturity. Coupon payments are deducted from CFO every year.

Scenario B: Market Interest Rates at Issuance = 11%

Calculation of bond proceeds:

$FV = \$100,000; N = 4; I/Y = 11; PMT = \$10,000; CPT PV; PV \rightarrow -\$96,897.55$

Cash flows from bonds:

- Alan will receive \$96,898 for these bonds today.
- Alan will pay an annual coupon of \$10,000 for 4 years.
- At the end of the Year 4, Alan will return the par value (\$100,000) to investors; **not** the issuance proceeds (\$96,898).

Interest Expense and Book Value of Discount Bond

Year	Beginning Liability \$	Interest Expense \$	Coupon Payment \$	Change in Liability \$	Closing Liability \$
0					96,898
1	96,898	10,659	10,000	659	97,556
2	97,556	10,731	10,000	731	98,287
3	98,287	10,812	10,000	812	99,099
4	99,099	10,901	10,000	901	100,000
Total		43,102	40,000	3,102	

Proceeds from bond issuance.	Market interest rate at issuance times beginning-of-year value of liability. For Year 1: $11\% \times \$96,898$	Interest expense minus coupon payment. For Year 1: $\$10,659 - \$10,000$	Beginning of year value of liability plus change in liability over the year. For Year 1: $\$96,898 + \659
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Every year, Alan pays out *less* in the form of coupon (cash outflow of \$10,000) than it owes in interest expense (e.g. \$10,659 in Year 1). This *shortfall* serves to *increase* the value of the liability over the period (e.g. the liability increases by \$659 over Year 1).

Important Shortcut 1:
Interest expense over the term of the bond can be calculated as all the issuer's outflows over the life of the bond (coupon payments plus principal repayment) minus the inflows received at issuance (bond proceeds).
Total interest expense over the 4 years:
 $\$100,000 + \$40,000 - \$96,898 = \$43,102$

Year 2 beginning liability equals Year 1 closing liability.

Effects on Financial Statements

Balance sheet: For bonds issued at a discount, the book value of the liability increases over the life of the bond. The entire discount (\$3,102) is amortized over the 4 years. The value of the liability at the end of Year 4 equals par value, which is the amount that must be paid to investors at maturity.

Income statement: Interest expense rises from year to year in line with the increasing book value of the liability.

Statement of cash flows: For bonds issued at a discount the inflow recorded at issuance under CFF (\$96,898) is *lower* than the outflow from CFF at maturity (\$100,000). Coupon payments (\$10,000) are deducted from CFO every year.

Scenario C: Market Interest Rates at Issuance = 9%

Calculation of bond proceeds:

FV = \$100,000; N = 4; I/Y = 9; PMT = \$10,000; CPT PV; PV → -\$103,239.71

Cash flows from bonds:

- Alan will receive \$103,240 for these bonds today.
- Alan will pay an annual coupon of \$10,000 for 4 years.
- At the end of Year 4, Alan will return the par value (\$100,000) to investors; **not** the initial proceeds from sale (\$103,239.71).

Interest Expense and Book Value of Premium Bond

Year	Beginning Liability \$	Interest Expense \$	Coupon Payment \$	Change in Liability \$	Closing Liability \$
0					103,240
1	103,240	9,292	10,000	-708	102,531
2	102,531	9,228	10,000	-772	101,759
3	101,759	9,158	10,000	-842	100,917
4	100,917	9,083	10,000	-917	100,000
Total		36,760	40,000	-3,240	

Proceeds from bond issuance.

Market interest rate at issuance times beginning of year liability.
 For Year 1:
 $9\% \times \$103,240$

Interest expense minus coupon payment.
 For Year 1:
 $\$9,292 - \$10,000$

Beginning of year value of liability plus change in liability.
 For Year 1:
 $\$103,240 + (-\$708)$

Every year, Alan pays out more in the form of coupon (cash outflow of \$10,000) than it owes in interest expense (e.g. \$9,292 in Year 1). This *excess* payment serves to *decrease* the book value of the liability each year (e.g. by \$708 in Year 1).

Effect on Financial Statements

Balance sheet: For bonds issued at a premium, the book value of the liability decreases over the life of the bond. The entire premium (\$3,240) is amortized over the 4 years. The value of the liability at the end of Year 4 equals the par value, which is the amount that must be paid to investors at maturity.

Income statement: Interest expense declines every year in line with the decreasing book value of the liability.

Statement of cash flows: For bonds issued at a premium, the inflow recorded at issuance under CFF (\$103,240) is *greater* than the outflow from CFF at maturity (\$100,000). Coupon payments (\$10,000) are deducted from CFO every year.

Important Shortcut 2

To determine the book value of the liability at any point in time, simply compute the present value of the bond's remaining cash flows discounting them at market interest rates at issuance.

Closing Liability (Year 2):
 FV = \$100,000;
 PMT = \$10,000;
 N = 2; I/Y = 9
 CPT PV; PV = \$101,759

For bonds issued at a premium or discount, deducting the coupon payment from CFO is not really reflective of the economics of the transaction. Let's take the **premium** bond in Scenario C for example. In Year 3, \$10,000 is deducted from CFO, while true interest expense is only **\$9,158**. The excess of the coupon payment over interest expense recognized (\$842) effectively reduces the value of the liability (the liability falls from \$101,759 in Year 2 to \$100,917 in Year 3). A reduction in a long-term liability is a *use of cash* that is deducted from CFF, so \$842 should be classified as an *outflow from financing activities* and \$9,158 should be the actual deduction from CFO. Deducting the entire \$10,000 coupon payment from CFO serves to *understate* CFO and *overstate* CFF.

Let's go through Scenario B to analyze cash flows for a **discount** bond. Interest expense in Year 2 equals \$10,731. However, Alan has deducted \$10,000 (the coupon payment) from CFO. Looking at the economics of the transaction, \$10,731 (total interest expense) should have been deducted from CFO; not just \$10,000. As a result, CFO has been *overstated*. Further, the increase in liability of \$731 (the amount by which the coupon payment falls short of recognized interest expense) over Year 2 is a **source of cash** to the firm and therefore, should really be classified as an *inflow from financing activities*. Alan has not recognized any related financing cash flows in Year 2, and therefore, its CFF has been *understated*.

Table 1 summarizes the accounting effects of issuing a par, premium or discount bonds. Table 2 summarizes the reclassified cash flows based on interest expense.

Table 1: Accounting Effects of Issuing Financing Liabilities

Year	Interest Expense			Balance Sheet Liability			Cash Flows From	
	Bond Issued at			Bond Issued at			Operations	Financing
	Par	Premium	Discount	Par	Premium	Discount		
1	10,000	9,292	10,659	100,000	102,531	97,556	10,000	
2	10,000	9,228	10,731	100,000	101,759	98,287	10,000	
3	10,000	9,158	10,812	100,000	100,917	99,099	10,000	
4	10,000	9,083	10,901	100,000	100,000	100,000	10,000	100,000
TOTAL	40,000	36,760	43,102				40,000	100,000

Table 2: Reclassification of Cash Flows Based on Interest Expense

Year	Actual Cash Outflow	Accounting Entries		Reclassification Based on Interest Expense			
		All Bonds		Premium Bond		Discount Bond	
		CFO	CFF	CFO	CFF	CFO	CFF
1	10,000	10,000		9,292	708	10,659	-659
2	10,000	10,000		9,228	772	10,731	-731
3	10,000	10,000		9,158	842	10,812	-812
4	10,000	10,000		9,083	917	10,901	-901
	100,000		100,000		100,000		100,000
TOTAL	140,000	40,000	100,000	36,760	103,240	43,102	96,898

Notice that in Tables 1 and 2, cash outflows are treated as positive numbers and cash inflows are treated as negative numbers.

Zero-Coupon Bonds

Zero-coupon bonds accrue interest over their terms. No coupon payments are made, and the lump sum payment at maturity includes repayment of principal and interest. Zero-coupon bonds are steeply discounted instruments because coupon rates (zero) fall significantly short of the compensation required by the market (market interest rate at issuance) for investing in them.

Example 1: Zero-Coupon Bonds

A company issues a 4 year, \$100,000 par, zero-coupon bond when market interest rates equal 10%. Calculate the proceeds from bond issuance, the periodic interest expense and the closing value of the liability at the end of each year.

Solution

The amount that the company receives upon bond issuance equals \$68,301 ($FV = -\$100,000$, $N = 4$; $I/Y = 10\%$; $PMT = 0$; $CPT PV$; $PV \rightarrow \$68,301$). Annual interest expense and the closing values of the liability are calculated below:

Year	Beginning Liability	Interest Expense	Coupon Payment	Change in Liability	Closing Liability
0					68,301
1	68,301	6,830	0	6,830	75,131
2	75,131	7,513	0	7,513	82,645
3	82,645	8,265	0	8,265	90,909
4	90,910	9,091	0	9,091	100,000
Total		31,699	0	31,699	

Economically speaking:

- Interest expense should have been treated as an *outflow from operating activities*.
- The same amount (interest expense not paid that served to increase the book value of the liability) should have been treated as an *inflow from financing activities*.

Conclusion: CFO has been overstated, while CFF has been understated.

Treatment of Financing Liabilities under U.S. GAAP and IFRS

The method that we have used in this reading to compute periodic interest expense is known as the *effective interest method*. It results in a constant rate of interest over the life of the bond. The effective interest method is required under IFRS and preferred under U.S. GAAP. The straight-line method of amortization, which is also permitted under U.S. GAAP, evenly amortizes the premium or discount over the life of the bond (similar to straight-line depreciation).

Costs like printing, legal fees and other charges are incurred when debt is issued. Under **IFRS**, these costs are included in the measurement of the liability, while under **U.S. GAAP**, companies usually capitalize these costs and write them off over the bond's term.

U.S. GAAP requires interest payments on bonds to be classified under CFO. **IFRS** allows more flexibility in that classification of interest payments as CFO or CFF is permitted.

Debt Extinguishment

If a company decides to redeem bonds before maturity, a **gain or loss on extinguishment** is computed by subtracting the amount paid to retire the bonds from their book value. For example, if a liability with a book value of \$5 million is retired before maturity for \$5.25 million, there is a loss on extinguishment of \$0.25 million. Under **U.S. GAAP**, because issuance costs are capitalized, any unamortized issuance costs must also be subtracted from gains on extinguishment. Under **IFRS**, issuance costs are included in the book value of the liability so there is no need to adjust the gain on extinguishment for these costs. The gain or loss on extinguishment is reported as a separate item on the income statement if significant, and more details regarding the redemption are discussed in the MD&A section.

LOS 39b: Explain the role of debt covenants in protecting creditors by restricting a company's ability to invest, pay dividends, or make other operating and strategic decisions. Vol 3, pg 524-525

Debt contracts often include clauses that protect bondholders by limiting the issuer's ability to invest, pay dividends or make other strategic and operating decisions. These restrictions or covenants also benefit borrowers (issuers) in that they reduce default risk and lower the cost of borrowing. Common covenants include:

- Maintenance of pledged collateral.
- Restrictions on dividend payments.
- Requirements to meet certain working capital levels.
- Maximum levels of leverage.

When a company violates a covenant it is said to be in default. In the event of default, bondholders can choose to waive the covenant, renegotiate, or call for repayment. Covenants are discussed in more detail in Reading 60.

LOS 39c: Describe the presentation of, and disclosures relating to, financing liabilities. Vol 3, pg 525-527

On the balance sheet, long-term liabilities are listed as one aggregate figure for all liabilities due after one year. Liabilities due within one year are included in short-term liabilities (current liabilities). Financial statement footnotes provide more information on the nature and types of long-term debt issued by the company. They usually include:

- Stated and effective interest rates.
- Maturity dates.
- Restrictions imposed by creditors.
- Pledged collateral.
- Scheduled repayments over the next five years.

More information regarding a firm's debt and off balance-sheet financing sources can be found in the MD&A section. The information in the footnotes and MD&A section is used to forecast patterns and levels of future cash flows.

LOS 39d: Determine the effects of changing interest rates on the market value of debt and on financial statements and ratios. Vol 3, pg 527

The book value of debt is based on the market interest rate at issuance. Subsequently, as market interest rates fluctuate, the actual value of the firm's debt deviates from its reported book value. For example, if interest rates rise, the current market value of debt would fall. The reported book value of debt (based on the market interest rate at issuance) would be *higher* than the true economic value of the firm's obligations. Using the book value will *overstate* leverage levels as the firm is actually better off than its financial statements indicate.

Two companies with identical book values of debt could have issued debt in very different circumstances. One could have issued debt at lower and older interest rates, while the other may have issued debt at higher current rates. The former is in the better economic position because the true economic value of its obligations is *lower*.

In a drive towards making balance sheets more current and economically accurate, recently issued IFRS and U.S. GAAP standards have expanded disclosures of the fair value of a firm's financial assets and liabilities, and allow companies to report fair values on the balance sheet.

LOS 39e: Describe two types of debt with equity features (convertible debt and debt with warrants) and calculate the effect of issuance of such instruments on a company's debt ratios. Vol 3, pg 527-535

Convertible Bonds

These are bonds that can be converted into common shares of the issuing company, usually at a pre-specified ratio. Typically, they have low coupon rates, and investors are compensated for these low rates by being granted the option to convert their bonds into ordinary shares of the company, usually at a discount to market value.

From the issuer's perspective the key benefit of raising money by issuing convertible bonds is *lower* coupon payments. However, they carry the cost of ownership dilution if, and when bondholders convert their bonds into shares.

Under **U.S. GAAP**, these securities are treated as liabilities. The entire proceeds are reclassified as equity upon conversion. Conversion is a significant noncash financing activity that is reported in supplemental information to the cash flow statement.

IFRS recognizes the economic effects of issuing such hybrid securities. The fair value of the bonds is reported as a liability, and the difference between the issue proceeds and the fair value of the liability is reported separately as equity on the balance sheet.

For analysis, we should classify convertible bonds as debt when the conversion price is *greater* than the market price. When the conversion price is significantly *lower* than the market price, it is highly likely that bondholders will convert their holdings into equity and that the liability will not have to be repaid. In this case, these securities must be classified as equity regardless of when they might be converted. Removal from liabilities and inclusion in equity will strengthen the company's capital structure.

Debt with Warrants

A warrant is a security that gives its holder the right to buy stock of the issuing company at a specified price, at a specified date in the future. It is very similar to a call option. Warrants are frequently attached to bonds as sweeteners, allowing the issuer to pay lower interest rates, while giving investors the option to participate in any future appreciation of the company's equity.

When bonds are issued with warrants, both **U.S. GAAP** and **IFRS** require the proceeds from each of the securities to be listed separately. The fair value of debt is listed under liabilities, while total proceeds from the issue minus the fair value of debt are classified as warrants and reported under equity.

Other Financial Instruments with Features of Debt and Equity

Until recently, firms enjoyed significant discretion in the classification of securities with debt and equity-like features on the balance sheet. Companies would avoid debt recognition, and choose to classify these securities as equity to report better (lower) leverage ratios.

Redeemable preferred stock is an example of a security that has both debt and equity-like features. Accounting standards now limit the favorable treatment of redeemable preference shares. They must be treated as debt and related dividends reported as interest expense.

Classification of redeemable preference shares as debt as opposed to equity *increases* the company's leverage ratios and *decreases* the interest coverage ratio.

LOS 39f: Discuss the motivations for leasing assets instead of purchasing them and the incentives for reporting the leases as operating leases rather than finance leases. Vol 3, pg 535-536

A **lease** is a contract between the owner of the asset (**lessor**) and another party that wants to use the asset (**lessee**). The lessee gains the right to use the asset for a period of time in return for periodic lease payments. Leasing an asset holds the following advantages over purchasing the asset:

- Leases often have fixed interest rates.
- They require no down payment so they conserve cash.
- At the end of the lease, the asset can be returned to the lessor so the lessee escapes the risk of obsolescence and is not burdened with having to find a buyer for the asset.
- Operating leases do not require recognition of an asset or a liability on the lessee's balance sheet so they improve reported performance and solvency ratios.
- In the U.S., leases can be structured as synthetic leases, where the company can gain tax benefits of ownership, while not reflecting the asset on its financial statements.

LOS 39g: Determine the effects of finance and operating leases on the financial statements and ratios of the lessees and lessors. Vol 3, pg 536-549

LESSEE'S PERSPECTIVE

U.S. GAAP requires a lessee to classify a lease as a finance(capital) lease if any of the following conditions hold:

1. The lease transfers ownership of the asset to the lessee at the end of the term.
2. A bargain purchase option exists.
3. The lease term is greater than 75% of the asset's useful economic life.
4. The present value of the lease payments exceeds 90% of the fair value of the leased asset.

If none of these conditions hold, the lessee may treat the lease as an operating lease. Under **IFRS**, classification of a lease depends on the economic substance of the transaction and managerial judgement.

Operating Lease (Lessee's Perspective)

The accounting treatment for an operating lease is similar to that of simply renting an asset for a period of time. The asset is not purchased; instead, payments are made for using it.

Under an operating lease, no lease-related entries are made on the balance sheet. The firm has effectively rented a piece of equipment. It has not purchased the asset so there is no addition to fixed assets, and it has not borrowed any money to finance the purchase, so there are no related liabilities.

Accounting Entries at Inception

Balance sheet: None, because no asset or liability is recognized.

Income statement: None, because the asset has not been used yet.

Cash flow statement: None, because there has been no cash transaction.

Accounting Entries Every Year During the Term of the Lease

Balance sheet: None, because no lease-related assets and liabilities are recognized.

Income statement: Leasehold (rental) expense is charged every year.

Cash flow statement: The lease payment is classified as cash outflow from operating activities.

Capital or Finance Lease (Lessee's Perspective)

A finance lease requires the company to recognize a lease-related asset and liability on its balance sheet at inception of the lease. The accounting treatment for a finance lease is similar to that of purchasing an asset and financing the purchase with a long-term loan.

Accounting Entries at Inception

Balance sheet: The present value of lease payments is recognized as a long-lived asset. The same amount is also recognized as a non-current liability.

Income statement: None because the asset has not been used yet.

Cash flow statement: None because no cash transaction has occurred. Disclosure of lease inception is required as a 'significant noncash financing and investing activity'.

Accounting Entries Every Year During the Term of the Lease

Balance sheet: The value of the asset falls every year as it is depreciated. Interest is charged on the liability as the appropriate discount rate times the beginning-of-year value of the liability. The excess of the lease payment over the year's interest expense reduces the liability.

Income statement: Depreciation expense (against the asset) and interest expense (on the liability) are charged every year.

Cash flow statement: The portion of the lease payment equal to the interest expense is subtracted from CFO, while the remainder that serves to reduce the liability is subtracted from CFF.

Example 2: Lease Classification by Lessees

ABC Company leases an asset for 4 years, making annual payments of \$10,000. The appropriate discount rate is 7%. Illustrate the effect on the financial statements if the lease is classified as a finance lease and an operating lease.

Solution

First let us work through the effects on the financial statements of the lessee if the lease is classified as a **finance lease**.

The present value of the lease payments is recognized as an asset and a liability. The PV of the lease payments equals \$33,872 (PMT = \$10,000; N = 4; I/Y = 7; CPT PV)

The table below illustrates the calculation of periodic interest expense and the closing value of the liability for a finance lease:

Year	Beginning Liability \$	Interest \$	Principal Repayment \$	Closing Liability \$
1	33,872	2,371	7,629	26,243
2	26,243	1,837	8,163	18,080
3	18,080	1,266	8,734	9,346
4	9,346	654	9,346	0

Present value of lease payments.

Discount rate times the value of the liability at the beginning of the period.
 For Year 1:
 $7\% \times \$33,872$

Lease payment minus interest component.
 For Year 1:
 $\$10,000 - \$2,371$

Beginning liability minus principal repayment. The excess of the lease payment over interest expense serves to retire a portion of the liability every year.
 For Year 1:
 $\$33,872 - \$7,629$

There are two ways to calculate the ending value of the liability for any period:

- Opening liability minus the excess of lease payment over the period's interest expense.
For Year 1: $\$33,872 - (\$10,000 - \$2,371) = \$26,243$
- Present value of remaining lease payments discounted at the appropriate rate.
For Year 1: N = 3, I/Y = 7, PMT = \$10,000, CPT PV; PV = \$26,243

In an **operating** lease, no lease-related asset or liability is recognized on the balance sheet. The lease payments are classified as operating expenses on the income statement.

Now let us compare the effects on the lessee's financial statements of classifying a lease as an operating or finance lease:

Balance Sheet

Value of asset recognized at inception = \$33,872 (Present value of lease payments)

Annual depreciation (Straight-line) = \$8,468

	Year 0	Year 1	Year 2	Year 3	Year 4
	\$	\$	\$	\$	\$
Assets					
Leased assets	33,872	33,872	33,872	33,872	33,872
Accumulated depreciation	0	8,468	16,936	25,404	33,872
Net leased assets	33,872	25,404	16,936	8,468	0
Liabilities					
Current portion of lease obligation	7,629	8,163	8,734	9,346	0
LT debt: Lease obligation	26,243	18,080	9,346	0	0
Total liabilities	33,872	26,243	18,080	9,346	0

Portion of liability that will be retired within the year is classified as a current liability

Portion of liability that will be retired in more than a year's time is classified as a long term liability

Table 3: Balance Sheet Effects of Lease Classification

Balance Sheet Item	Finance Lease	Operating Lease
Assets	Higher	Lower
Current liabilities	Higher	Lower
Long term liabilities	Higher	Lower
Total cash	Same	Same

Income Statement

In an operating lease, the annual lease payments is recognized as an operating expense, while in a finance lease, the asset is depreciated and interest expense is charged against operating income (EBIT).

Year	Finance Lease			Operating Lease	
	Depreciation Expense	Interest Expense	Total Expense	Rent Expense	Total Expense
	\$	\$	\$	\$	\$
1	8,468	2,371	10,839	10,000	10,000
2	8,468	1,837	10,305	10,000	10,000
3	8,468	1,266	9,734	10,000	10,000
4	8,468	654	9,122	10,000	10,000
TOTAL	33,872	6,128	40,000	40,000	40,000

Table 4: Income Statement Effects of Lease Classification

Income Statement Item	Finance Lease	Operating Lease
Operating expenses	Lower (Depreciation)	Higher (Lease payment)
Nonoperating expenses	Higher (Interest expense)	Lower (None)
EBIT (operating income)	Higher	Lower
Total expenses- early years	Higher	Lower
Total expenses- later years	Lower	Higher
Net income- early years	Lower	Higher
Net income- later years	Higher	Lower

Statement of Cash Flows

Under an operating lease, the lease payments is deducted from CFO, while for a finance lease the interest expense portion of the lease payment is deducted from CFO, and the remainder that serves to decrease the value of the liability is deducted from CFF.

Year	Finance Lease			Operating Lease
	CFO \$	CFF \$	Total \$	CFO \$
1	-2,371	-7,629	-10,000	-10,000
2	-1,837	-8,163	-10,000	-10,000
3	-1,266	-8,734	-10,000	-10,000
4	-654	-9,346	-10,000	-10,000

Table 5: Cash Flow Effects of Lease Classification

CF Item	Finance Lease	Operating Lease
CFO	Higher	Lower
CFF	Lower	Higher
Total cash flow	Same	Same

Table 6: Impact of Lease Classification on Financial Ratios

Ratio	Numerator under Finance Lease	Denominator under Finance Lease	Effect on Ratio	Ratio Better or Worse under Finance Lease
Asset turnover	Sales- same	Assets- higher	Lower	Worse
Return on assets*	Net income- lower	Assets- higher	Lower	Worse
Current ratio	Current assets- same	Current liabilities- higher	Lower	Worse
Leverage ratios (D/E and D/A**)	Debt- higher	Equity- same Assets- higher	Higher	Worse
Return on equity*	Net income- lower	Equity- same	Lower	Worse

* In early years of the lease agreement.

Note: Lower ROE under a finance lease is due to lower net income (numerator effect), while lower ROA is primarily due to higher assets (denominator effect).

**Notice that both the numerator and the denominator for the D/A ratio are higher when classifying the lease as a finance lease. Beware of such exam questions. When the numerator and the denominator of any ratio are heading in the same direction (either increasing or decreasing), determine which of the two is changing more in percentage terms. If the percentage change in the numerator is greater than the percentage change in the denominator, the numerator effect will dominate.

Firms usually have lower levels of total debt compared to total assets. The increase in both debt and assets by classifying the lease as a finance lease will lead to an increase in the debt to asset ratio because the percentage increase in the numerator is greater.

Disclosures

Lease disclosures list the lease obligations of the firm for the next five years under all operating and finance leases. These disclosures can be used to determine the effect on the financial statements if all the operating leases were capitalized and brought 'on to' the balance sheet.

Example 3: Analysis of Lease Disclosures

ABC Company has significant commitments under finance and operating leases. Presented below is selected financial statement information:

	Year	Finance \$	Operating \$
	2009	1,500	4,500
	2010	1,500	4,000
	2011	1,500	4,250
	2012	1,500	5,000
	2013	1,500	5,250
	2014	1,850	4,750
	2015	1,850	4,800
	2016	1,850	4,800
	2017	2,000	3,500
	2018	2,000	3,200
Minimum future lease payments		17,050	44,050
Less: Total interest amount		7,116.34	
Present value of minimum lease payments		9,933.66	

1. Calculate the implicit rate used to calculate present value of minimum lease payments.
2. Why is this implicit rate important in evaluating the company's leases?
3. If operating leases were to be classified as capital leases, what additional amount would be recognized on the balance sheet under lease obligations?
4. What would be the effect on the debt-to-equity ratio of treating all leases as finance leases?

Solution

1. The rate implicit in the lease is the discount rate that equates the present value of future lease payments to the given present value (\$9,933.66). It is equivalent to the IRR of the cash flow stream. In this example, the rate equals 10.5%.
2. The rate implicit in the lease is important because it is used to determine the present value of lease obligations (liability), the value of the leased asset on the balance sheet, interest expense, and the lease amortization schedule. Companies may use higher implicit rates to report lower debt levels. The validity of the rate used by the company can be evaluated by comparing it to the rates used by comparable firms and considering recent market conditions.
3. If the operating leases were treated as finance leases, the present value of lease payments would be recognized as an asset and a liability. The present value of operating lease obligations equals \$26,798 (using the 10.5% implicit rate).
4. Debt levels rise when operating leases are recognized on the balance sheet. Therefore, the debt-to-equity ratio rises (worsens).

LOS 39h: Distinguish between a sales-type lease and a direct financing lease, and determine the effects on the financial statements and ratios of the lessors.

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LESSOR'S PERSPECTIVE

Lessors are required to recognize finance leases when any one of the four criteria for recognition of a finance lease by the lessee hold, and the following two criteria also hold:

1. Collectability of the lease payments is predictable.
2. There are no significant uncertainties regarding the amount of costs still to be incurred by the lessor under the provisions of the lease agreement.

When the lease is classified as an operating lease, the asset is listed on the balance sheet of the lessor, who continues to depreciate it. No lease-related asset shows up on the lessee's balance sheet.

Leases not meeting these criteria must be classified as operating leases because the earnings process is not complete, or the risks and benefits of the assets have not been transferred.

If the lessor classifies the lease as an operating lease, it records lease revenue when earned, continues to list the asset on its balance sheet, and depreciates it every year on its income statement. If the lessor classifies the lease as a finance lease, it records a receivable equal to the present value of lease payments on its balance sheet, and removes the asset from long-lived assets in its books.

When the lease is classified as a finance lease, the lessor removes the long-lived asset from its balance sheet, and instead records a receivable in its books. The lessee records the long-lived asset on its balance sheet and depreciates it.

Finance Leases

Some manufacturers offer their customers financing options to purchase their products. These **sales-type leases** result in a gross profit, (the normal selling price of the product minus its cost) which is recognized at inception of the lease, and interest income as payments are received over the lease term. In a sales-type lease the present value of lease payments equals the *selling price* of the asset.

Financial institutions and leasing companies offer financial leases that generate interest income only. These are known as **direct financing leases**, where the present value of lease payments equals the *carrying value* of the asset. Further, there is no gross profit recognition at lease inception.

Example 4: Operating Lease versus Direct Financing Lease- Lessor's Perspective

A company leases out a piece of equipment for four years in return for a lease payment of \$10,000 every year. At the end of the lease term the asset will have no salvage value. The discount rate applicable is 6% and the carrying value of the leased asset is \$34,651.

Solution

We must calculate the present value of lease payments to determine whether the lease should be classified as a sales-type lease or a direct financing lease.

The present value of lease payments equals \$34,651 (PMT = \$10,000; I/Y = 6; N = 4; FV = 0; CPT PV), which equals the carrying value of the asset on the lessor's books. Therefore, this is a direct financing lease.

At inception, the lessor removes the carrying value of the equipment from long-lived assets in its books. Instead, the lessor recognizes a lease receivable asset equal to the present value of lease payments.

Lease Amortization Schedule

Year	Opening Lease Receivable \$	Interest Income \$	Lease Payment \$	Reduction in Lease Receivable \$	Closing Lease Receivable \$
1	34,651	2,079	10,000	7,921	26,730
2	26,730	1,604	10,000	8,396	18,334
3	18,334	1,100	10,000	8,900	9,434
4	9,434	566	10,000	9,434	0
TOTAL		5,349	40,000	34,651	

The present value of the lease payments receivable over the term of the lease.

The discount rate multiplied by the opening balance of lease receivable account.
For Year 1:
6% × \$34,651

The excess of the annual lease payment over interest income.
For Year 1
10,000 - 2,079

Opening lease receivable adjusted for the reduction in lease receivable over the year.
For Year 1
34,651 - 7,921

For Year 3, the lessee owed the company interest of \$1,100. However, the total payment made by the lessee in year 3 was \$10,000. The excess (\$10,000-\$1,100) was used to reduce total amount receivable.

Effects on Income Statement

Depreciable value = \$34,651
Life of asset = 4 years
Annual depreciation = \$8662.75

In an operating lease, the lessor realizes rental income every year, and charges depreciation expense on the asset leased out.

Year	Direct Financing Lease		Operating Lease		
		Income	Revenue	Depreciation	Income
1	Interest income	2,079	10,000	8,662.75	1,337.25
2	Interest income	1,604	10,000	8,662.75	1,337.25
3	Interest income	1,100	10,000	8,662.75	1,337.25
4	Interest income	566	10,000	8,662.75	1,337.25
TOTAL		5,349			5,349

In the early years, higher income is recognized under a direct financing lease. This results in more taxes being paid out sooner.

Total income over the term of the lease is the same across both classifications.

Higher income is recognized in later years under an operating lease. Payment of taxes is therefore, delayed for a period.

Effects on Cash flow Statement

	Direct Financing Lease		Operating Lease	
Year	CFO	CFI	Total	CFO
1	2,079	7,921	10,000	10,000
2	1,604	8,396	10,000	10,000
3	1,100	8,900	10,000	10,000
4	566	9,434	10,000	10,000
TOTAL	5,349	34,651	40,000	40,000

Total cash flow over the lease term is the same under both classifications. Notice however, that CFO is higher under an operating lease while CFI is higher under a financing lease.

Interest income is a cash inflow from operations.

Reduction in lease receivable asset is a cash inflow from investing activities.

Table 7: Financial Statement Effects of Lease Classification from Lessor's Perspective

	Financing Lease	Operating Lease
Total net income	Same	Same
Net income (early years)	Higher	Lower
Taxes (early years)	Higher	Lower
Total CFO	Lower	Higher
Total CFI	Higher	Lower
Total cash flow	Same	Same

Sales-Type Leases

In a sales-type lease, the present value of lease payments is greater than the carrying value of asset in the lessor's books. Consequently, the lessor recognized a gross profit equal to the difference between the two in the year of inception, and recognizes interest income over the term of the lease.

Example 5: Sales-Type Leases

A company leases out a piece of equipment for four years in return for a lease payment of \$10,000 every year. At the end of the lease term, the asset will have no salvage value. The discount rate applicable is 6% and the carrying value of the asset is \$30,000.

Solution

Notice that we are working with similar numbers as in Example 4. We have only changed the carrying value of the asset on the lessor's books to \$30,000 in this example.

Since the present value of lease payments (which we have previously calculated as \$34,651) is *greater* than the carrying value of the asset, this is a sales-type lease.

At the inception, the lessor will recognize a gross profit of \$4,651 (\$34,651 - \$30,000).

The lessor also recognizes interest income over the term of the lease. Notice that interest income is the same as we had calculated in the direct financing lease in Example 4. We only changed the carrying value of the asset in this example to illustrate that under a sales type lease, in addition to interest income, the lessor also recognizes a gross profit on sale that increases total income over the lease, and results in a significant contribution to profits at inception.

Lease Amortization Schedule

Year	Opening Lease Receivable	Interest Income	Lease Payment	Reduction in Lease Receivable	Closing Lease Receivable
1	34,651	2,079	10,000	7,921	26,730
2	26,730	1,604	10,000	8,396	18,334
3	18,334	1,100	10,000	8,900	9,434
4	9,434	566	10,000	9,434	0
TOTAL		5,349	40,000	34,651	

LOS 39i: Describe the types and economic consequences of off-balance-sheet financing, and determine how take-or-pay contracts, throughput arrangements, and the sale of receivables affect financial statements and selected financial ratios. Vol 3, pg 555-559

Take-or-Pay and Throughput Arrangements

Under a take-or-pay contract or throughput arrangement, a company commits to purchase a minimum quantity of an input over a period of time. Prices could be fixed or linked to market prices, but the arrangement assures the company of a constant and predictable supply of raw materials for its operations. No related details are listed on the balance sheet; the company is only required to disclose the nature of the commitments and the minimum payments required in the footnotes to the financial statements or in the MD&A.

These arrangements effectively keep some operating assets and liabilities off the balance sheet. For the purpose of analysis, the present value of the minimum commitments that have been made under the take-or-pay contract should be added to liabilities, and to assets on the balance sheet. This adjustment increases the company's solvency ratios.

Sale of Receivables with Recourse

A firm may sell its accounts receivable to an unrelated party to accelerate inflows of cash. If the purchaser of receivables does not bear the risk of non-collection i.e., the risk is still borne by the seller, the transaction is basically just like taking a loan and collateralizing it with the receivables. If the receivables are not entirely realized, the loss is borne by the seller.

When the receivables are first sold, accounts receivables fall, and the cash received contributes to CFO. However, if the risk of non-realization is still borne by the seller, an analyst must adjust accounts receivable and current liabilities upwards. The amount of this upward revision should be the value of receivables sold that have not been collected yet. Also, the cash inflow previously classified as CFO must be reclassified as CFF to reflect the fact that this transaction is effectively, merely a collateralized borrowing.

Table 8: Impact of Reclassification of Sale of Receivables

CFO	Lower
CFF	Higher
Total Cash Flow	Same
Current Assets	Higher
Current Liabilities	Higher
Current Ratio (Assuming it was greater than 1)	Lower