$$\text{FCFF} = \text{CFO} + [\text{cash interest paid} \times (1 - \text{tax rate})] - \text{fixed capital investment}$$

$$= \$50{,}000 + \$500(1 - 0.4) - \$0 = \$50{,}300$$

$$\text{FCFE} = \text{CFO} - \text{fixed capital investment} + \text{net borrowing}$$

$$= \$50{,}000 - \$0 + \$5{,}000 = \$55{,}000$$

Alternatively, FCFE = FCFF − [interest paid × (1 − tax rate)] + net borrowing

$$= \$50{,}300 - \$500(1 - 0.4) + \$5{,}000 = \$55{,}000$$

Other Cash Flow Ratios

Just as with the income statement and balance sheet, the cash flow statement can be analyzed either over time or by comparing it to those of other firms. Cash flow ratios can be categorized as performance ratios and coverage ratios.

Performance Ratios

The **cash flow-to-revenue ratio** measures the amount of operating cash flow generated for each dollar of revenue:

$$\text{cash-flow-to-revenue ratio} = \frac{\text{CFO}}{\text{net revenue}}$$

The **cash return-on-assets ratio** measures the return of operating cash flow attributed to all providers of capital:

$$\text{cash-return-on-assets ratio} = \frac{\text{CFO}}{\text{average total assets}}$$

The **cash return-on-equity ratio** measures the return of operating cash flow attributed to shareholders:

$$\text{cash-return-on-equity ratio} = \frac{\text{CFO}}{\text{average total equity}}$$

The **cash-to-income ratio** measures the ability to generate cash from firm operations:

$$\text{cash-to-income ratio} = \frac{\text{CFO}}{\text{operating income}}$$

Cash flow per share is a variation of basic earnings per share measured by using CFO instead of net income:

$$\text{cash flow per share} = \frac{\text{CFO} - \text{preferred dividends}}{\text{weighted average number of common shares}}$$

Note: If common dividends were classified as operating activities under IFRS, they should be added back to CFO for calculating cash flow per share.

Coverage Ratios

The **debt coverage ratio** measures financial risk and leverage:

$$\text{debt coverage ratio} = \frac{\text{CFO}}{\text{total debt}}$$

The **interest coverage ratio** measures the firm's ability to meet its interest obligations:

$$\text{interest coverage ratio} = \frac{\text{CFO} + \text{interest paid} + \text{taxes paid}}{\text{interest paid}}$$

Note: If interest paid was classified as a financing activity under IFRS, no interest adjustment is necessary.

The **reinvestment ratio** measures the firm's ability to acquire long-term assets with operating cash flow:

$$\text{reinvestment ratio} = \frac{\text{CFO}}{\text{cash paid for long-term assets}}$$

The **debt payment ratio** measures the firm's ability to satisfy long-term debt with operating cash flow:

$$\text{debt payment} = \frac{\text{CFO}}{\text{cash long-term debt repayment}}$$

The **dividend payment ratio** measures the firm's ability to make dividend payments from operating cash flow:

$$\text{dividend payment ratio} = \frac{\text{CFO}}{\text{dividends paid}}$$

The **investing and financing ratio** measures the firm's ability to purchase assets, satisfy debts, and pay dividends:

$$\text{investing and financing ratio} = \frac{\text{CFO}}{\text{cash outflows from investing and financing activities}}$$

MODULE QUIZ 31.1

1. In preparing a common-size cash flow statement, each cash flow is expressed as a percentage of:
   A. total assets.
   B. total revenue.
   C. the change in cash.
2. To calculate free cash flow to the firm based on operating cash flow, an analyst should add interest expense net of tax and subtract:
   A. noncash charges.
   B. fixed capital investment.
   C. working capital investment.
3. The reinvestment ratio measures a firm's ability to use its operating cash flow to:
   A. pay dividends.
   B. invest in working capital.
   C. acquire long-lived assets.

KEY CONCEPTS

LOS 31.a

An analyst should determine whether a company is generating positive operating cash flow over time that is greater than its capital spending needs and whether the

company's accounting policies are causing reported earnings to diverge from operating cash flow.

A common-size cash flow statement shows each item as a percentage of revenue, or shows each cash inflow as a percentage of total inflows and each outflow as a percentage of total outflows.

LOS 31.b

Free cash flow to the firm (FCFF) is the cash available to all investors, both equity owners and debtholders:

- FCFF = net income + noncash charges + [cash interest paid × (1 − tax rate)] − fixed capital investment − working capital investment
- FCFF = CFO + [cash interest paid × (1 − tax rate)] − fixed capital investment

Free cash flow to equity (FCFE) is the cash flow that is available for distribution to the common shareholders after all obligations have been paid.

$$\text{FCFE} = \text{CFO} - \text{fixed capital investment} + \text{net borrowing}$$

Cash flow performance ratios (e.g., cash return on equity or on assets) and cash coverage ratios (e.g., debt coverage or cash interest coverage) provide information about the firm's operating performance and financial strength.

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 31.1

1. **B** The cash flow statement can be converted to common-size format by expressing each line item as a percentage of revenue. (LOS 31.a)
2. **B** FCFF can be calculated from CFO by adding interest expense net of tax and subtracting fixed capital investment. (LOS 31.b)
3. **C** The reinvestment ratio is CFO/cash paid for long-term assets. (LOS 31.b)

READING 32

ANALYSIS OF INVENTORIES

INTRODUCTION

This reading assumes that you are familiar with the cost flow methodologies first-in, first-out (FIFO), last-in, first-out (LIFO), and average cost. You should also be able to compute cost of sales (cost of goods sold, or COGS), gross profit margin, and ending inventory under each cost flow approach. You should also be aware of how to adjust financial statements from LIFO to FIFO using disclosures relating to the LIFO reserve. Ensure that you are aware of which costs can be capitalized in ending inventory and which costs must be expensed. These topics are covered in the prerequisite readings.

MODULE 32.1: INVENTORY MEASUREMENT

Video covering this content is available online.

LOS 32.a: Describe the measurement of inventory at the lower of cost and net realisable value and its implications for financial statements and ratios.

Under IFRS, inventory is reported on the balance sheet at the lower of cost or net realizable value. **Net realizable value (NRV)** is equal to the expected sales price less the estimated selling costs and completion costs. If NRV is less than the balance sheet value of inventory, the inventory is "written down" to NRV, and the loss is recognized in the income statement either as a separate line item or by increasing cost of goods sold. If the value of the inventory recovers later, the inventory can be "written up," and the gain is recognized in the income statement as a separate line item or by reducing COGS by the amount of the recovery. Because inventory is valued at the lower of cost or NRV, inventory cannot be written up by more than it was previously written down.

PROFESSOR'S NOTE

The write-down (or subsequent write-up) of inventory is usually accomplished through the use of a valuation allowance account, which is a contra-asset account similar to accumulated depreciation. By using a valuation allowance account, the firm is able to separate the original cost of inventory from the carrying value of the inventory.

Under U.S. GAAP, companies that use inventory cost methods other than LIFO or the retail method report inventories at the lower of cost or NRV. For companies using LIFO or the retail method, inventory is reported on the balance sheet at the **lower of cost or**

market. Market is usually equal to replacement cost, but it cannot be greater than NRV or less than NRV minus a normal profit margin. If replacement cost exceeds NRV, then market is NRV. If replacement cost is less than NRV minus a normal profit margin, then market is NRV minus a normal profit margin.

PROFESSOR'S NOTE

Think of lower of cost or market, where *market* cannot be outside a range of values. The range is from NRV minus a normal profit margin, to NRV. So, the size of the range is the normal profit margin. *Net* means the sales price less selling and completion costs.

The retail method is not explained in the Level I curriculum. Companies that resell merchandise can use this method. The methodology involves computing the cost of goods available for sale (beginning inventory + purchases). The cost of goods sold is estimated by taking sales and deducting the normal profit margin. Finally, ending inventory is computed as cost of goods sold less goods available for sale.

If the market value of inventory decreases below its cost, the inventory is written down to market on the balance sheet. The decrease in value is recognized in the income statement by increasing COGS for relatively small changes in value, or by recording the loss from the inventory write-down separately for a relatively large change in value. The market value becomes the new cost basis.

If there is a subsequent recovery in value, no write-up is allowed under U.S. GAAP. This applies to companies using lower of cost or NRV as well as those using lower of cost or market.

EXAMPLE: Inventory write-down

Zoom, Inc. (Zoom), sells digital cameras. Per-unit cost information pertaining to Zoom's inventory is as follows:

Original cost	$210
Estimated selling price	$225
Estimated selling costs	$22
Net realizable value	$203
Replacement cost	$197
Normal profit margin	$12

What are the per-unit carrying values of Zoom's inventory using (1) lower of cost or NRV and (2) lower of cost or market?

Answer:

Using the lower of cost or NRV, because the original cost of $210 exceeds net realizable value ($225 – $22 = $203), the inventory is written down to the net realizable value of $203. The $7 decrease in value ($203 NRV – $210 original cost) is reported in the income statement.

Using the lower of cost or market, market is equal to the replacement cost of $197 because NRV of $203 is greater than replacement cost, and NRV minus a normal profit margin ($203 − $12 = $191) is less than replacement cost. Because original cost exceeds market (replacement cost), the inventory is written down to $197, and a $13 loss ($197 replacement cost − $210 original cost) is reported in the income statement.

EXAMPLE: Inventory write-up

Assume that in the year after the write-down in the previous example, NRV and replacement cost both increase by $10. What is the impact of the recovery under IFRS, and under U.S. GAAP if lower of cost or market is used?

Answer:

Under IFRS, Zoom will write up inventory to $210 per unit and recognize a $7 gain in its income statement. The write-up (gain) is limited to the original write-down of $7. The carrying value cannot exceed original cost.

Under U.S. GAAP, no write-up is allowed. The per-unit carrying value will remain at $197. Zoom will simply recognize higher profit when the inventory is sold.

Recall from the prerequisite readings that LIFO ending inventory is based on older, lower costs (assuming inflation) than under FIFO. Because cost is the basis for determining whether an impairment has occurred, LIFO firms are less likely to recognize inventory write-downs than firms using FIFO or weighted average cost.

Analysts must understand how an inventory write-down or write-up affects a firm's ratios. For example, a write-down may significantly affect inventory turnover in current and future periods. Thus, comparability of ratios across periods may be an issue.

In certain industries, reporting inventory above historical cost is permitted under IFRS and U.S. GAAP. This exception applies primarily to producers and dealers of commodities, such as agricultural and forest products, mineral ores, and precious metals. Under this exception, inventory is reported at NRV, and any unrealized gains and losses from changing market prices are recognized in the income statement. If an active market exists for the commodity, the quoted market price is used to value the inventory. Otherwise, recent market transactions are used.

A write-down of inventory to NRV affects the financial statements and ratios in several ways. Assuming the write-down is reported as part of the cost of sales, these effects in the period of the write-down include the following:

- Because inventory is a current asset, an inventory write-down decreases both current and total assets.
- The current ratio (CA/CL) decreases. The quick ratio is unaffected because inventories are not included in its numerator.

- Inventory turnover (COGS/average inventory) increases, which decreases days' inventory on hand and the cash conversion cycle.
- The decrease in total assets increases total asset turnover and increases the debt-to-assets ratio.
- Equity decreases, increasing the debt-to-equity ratio.
- The increase in COGS decreases gross margin, operating margin, and net margin.
- The percentage decrease in net income can be expected to be greater than the percentage decrease in assets or equity. As a result, both return on assets (ROA) and return on equity (ROE) decrease.

For periods that follow a write-down of inventory to NRV, COGS may be decreased by lower inventory carrying values, which will increase profitability. Together with the decreases in assets and equity from the write-down, an increase in net income from decreased COGS will increase reported ROA and ROE in subsequent periods.

MODULE 32.2: INFLATION IMPACT ON FIFO AND LIFO

Video covering this content is available online.

LOS 32.b: Calculate and explain how inflation and deflation of inventory costs affect the financial statements and ratios of companies that use different inventory valuation methods.

During inflationary periods and with stable or increasing inventory quantities, LIFO COGS is higher than FIFO COGS. This is because the last units purchased have a higher cost than the first units purchased. Under LIFO, the more costly last units purchased are assumed to be the first units sold. Of course, higher COGS under LIFO will result in lower gross profit and net income compared to FIFO.

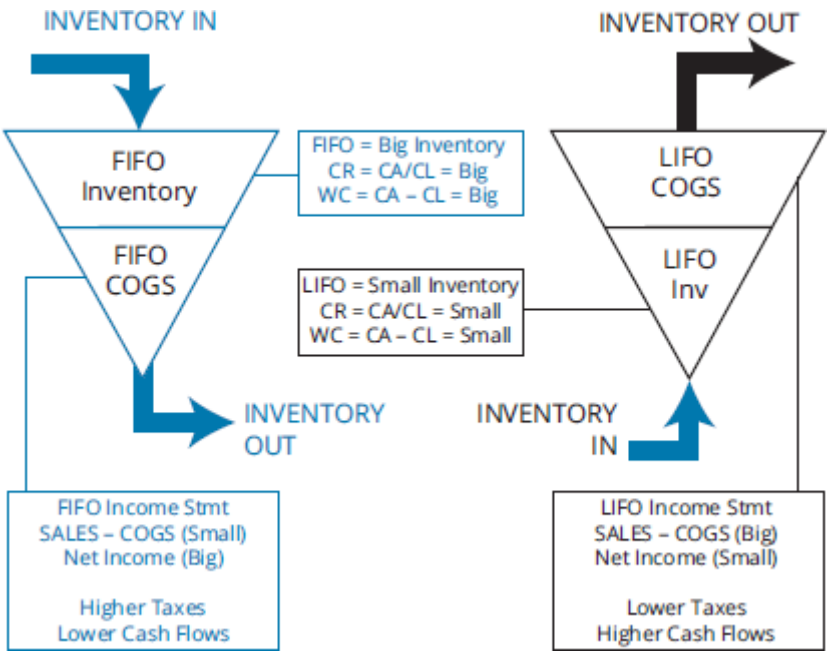
Using similar logic, we can see that LIFO ending inventory is lower than FIFO ending inventory because under LIFO, ending inventory is valued using older, lower costs.

During deflationary periods, assuming stable or increasing inventory quantities, the cost flow effects of using LIFO and FIFO will be reversed; that is, LIFO COGS will be lower, and LIFO ending inventory will be higher. This makes sense because the most recent lower-cost purchases are assumed to be sold first under LIFO, and the units in ending inventory are assumed to be the earliest purchases with higher costs.

Consider the diagram in Figure 32.1 to help visualize the FIFO-LIFO difference during periods of rising prices and growing inventory levels.

Figure 32.1: LIFO and FIFO Diagram–Rising Prices and Growing Inventory

Balances



Remember, it's not the older or newer physical inventory units that are reported in the income statement and balance sheet; rather, it is the *costs* that are assigned to the units sold and to the units remaining in inventory.

PROFESSOR'S NOTE
Be able to describe the effects of LIFO and FIFO, assuming inflation, in your sleep. When prices are falling, the effects are simply reversed. When you are finished with this review, take the time to look at these graphs and relationships again to solidify the concepts in your mind.

During periods of stable prices, the LIFO, FIFO, and average cost methods will yield the same results for inventory, COGS, and gross profit. During periods of trending prices (up or down), different cost flow methods may result in significant differences in these items.

PROFESSOR'S NOTE
The presumption in this section is that inventory quantities are stable or increasing.

When prices are rising or falling, FIFO provides the most useful measure of ending inventory. Recall that FIFO inventory is made up of the most recent purchases. These purchase costs can be viewed as a better approximation of current cost, and thus a better approximation of economic value. LIFO inventory, by contrast, is based on older costs that may differ significantly from current economic value.

Changing prices can also produce significant differences between COGS under LIFO and FIFO. Recall that LIFO COGS is based on the most recent purchases. As a result, when prices are rising, LIFO COGS will be higher than FIFO COGS. When prices are falling, LIFO COGS will be lower than FIFO COGS. Because LIFO COGS is based on the most recent purchases, LIFO COGS produces a better approximation of current cost in the income statement.

When prices are changing, the average cost method will produce values of COGS and ending inventory between those of FIFO and LIFO.

Because COGS is subtracted from revenue in calculating gross profit, gross profit is also affected by the choice of cost flow method. Assuming inflation, higher COGS under LIFO will result in lower gross profit. In fact, all profitability measures (gross profit, operating profit, income before taxes, and net income) will be affected by the choice of cost flow method.

Figure 32.2: Effects of Inventory Valuation Methods

	FIFO	LIFO
Cost of sales	Lower	Higher
Ending inventory	Higher	Lower
Gross profit	Higher	Lower

Note: This assumes increasing prices and stable or increasing inventory levels.

Effects on Ratios

Again, assuming increasing prices and stable or rising inventory levels, we can trace the ratio effects of the adjustments of LIFO values to FIFO values.

Profitability. Compared to FIFO, LIFO produces higher COGS in the income statement and results in lower earnings. Any profitability measure that includes COGS will be higher under FIFO. For example, FIFO COGS will result in higher gross margins, operating margins, and net profit margins as compared to LIFO.

Liquidity. Compared to FIFO, LIFO results in a lower inventory value on the balance sheet. Because inventory (a current asset) is higher under FIFO, the current ratio, a popular measure of liquidity, is also higher under FIFO. Working capital is higher under FIFO as well, because current assets are higher.

Activity. Inventory turnover (COGS / average inventory) is higher for firms that use LIFO compared to firms that use FIFO. Under LIFO, COGS is valued at more recent, higher costs (higher numerator), while inventory is valued at older, lower costs (lower denominator). Adjusting to FIFO values will result in lower turnover and higher days of inventory on hand (365 / inventory turnover).

Solvency. Adjusting to FIFO results in higher total assets because inventory is higher. Higher total assets under FIFO result in higher stockholders' equity (assets – liabilities). Because total assets and stockholders' equity are higher under FIFO, the debt ratio and the debt-to-equity ratio are lower under FIFO compared to LIFO.

LIFO Liquidation

A **LIFO liquidation** occurs when a LIFO firm's inventory quantities decline. Older, lower costs are included in COGS compared to a situation in which inventory quantities are not declining. LIFO liquidation results in higher profit margins and higher income taxes compared to what they would be if inventory quantities were not declining. The extra profit reported with a LIFO liquidation inflates operating margins by recognizing

historical inflationary gains from increasing inventory prices as income in the current period. Increases in profit margins from LIFO liquidation are not sustainable, however, because a firm cannot continue forever to sell existing inventory without replenishment.

Management could use a LIFO liquidation (draw down inventory) to artificially inflate current period earnings. Inventory declines can also be caused by events outside the management's control, such as strikes or materials shortages at a key supplier that make inventory reduction involuntary, or a decline in expected customer orders that results in a voluntary reduction in inventory to suit market conditions.

Analysts must look to the LIFO reserve disclosures in the footnotes to see if the LIFO reserve has decreased over the period, which would indicate the possibility of a LIFO liquidation that requires adjustment of profit margins if its impact has been significant.

EXAMPLE: Comparing FIFO and LIFO with a LIFO liquidation

Willock Corporation is a retailer incorporated at the start of Year 1. Sales prices and purchase costs have been inflating at 5% per annum. Using the data provided on sales and purchase units and prices compute Willocks gross profit and gross profit margin using FIFO and LIFO cost flow methodology. (Assume all purchases each year are made at the beginning of the year for the indicated prices.)

Data: Units	Year 1	Year 2	Year 3
Sales	10,000	12,000	16,000
Beginning Inventory	0	4,000	7,000
Purchases	14,000	15,000	10,000
Available for sale	14,000	19,000	17,000
Ending inventory	(4,000)	(7,000)	(1,000)
Units sold	10,000	12,000	16,000

Sales and purchase prices	Year 1	Year 2	Year 3
Sales price	$100	$105	$110
Purchase price	$80	$84	$88

Answer:

FIFO Gross Profit	Year 1	Year 2	Year 3
	$	$	$
Sales	1,000,000	1,260,000	1,760,000
Beginning inventory	0	320,000	588,000
Purchases	1,120,000	1,260,000	880,000
Available for sale	1,120,000	1,580,000	1,468,000
Ending inventory	–320,000	–588,000	–88,000
Cost of goods sold	800,000	992,000	1,380,000
Gross profit	$200,000	$268,000	$380,000

LIFO Gross Profit	Year 1	Year 2	Year 3
	$	$	$
Sales	1,000,000	1,260,000	1,760,000
Beginning inventory	0	320,000	572,000
Purchases	1,120,000	1,260,000	880,000
Available for sale	1,120,000	1,580,000	1,452,000
Ending inventory	–320,000	–572,000	–80,000
Cost of goods sold	800,000	1,008,000	1,372,000
Gross profit	$200,000	$252,000	$388,000

In Year 1, LIFO and FIFO gross profit is the same. This is because there was no beginning inventory and we assumed the purchases in the year were all at the same price. If purchases had been made at different prices during Year 1, FIFO and LIFO results would differ.

In Year 2, FIFO gives a higher gross margin because ending inventory is valued at the most recent purchase price of $84, compared to LIFO which values 4,000 units of ending inventory at the older purchase price of $80 and the remaining 3,000 units at $84. This result should not be a surprise as both purchase prices and ending inventory quantities increased.

In Year 3, LIFO gives a higher gross margin even though purchase prices are inflating. This unusual result is caused by a LIFO liquidation. Inventory levels decreased during the year because the number of units purchased was less than the number of units sold.

Key Ratios	Year 1	Year 2	Year 3
FIFO gross margin	20.00%	21.27%	21.59%
LIFO gross margin	20.00%	20.00%	22.05%

The impact of the LIFO liquidation can be detected in the company's gross profit margins. In Year 2, because of both rising purchase prices and increasing inventory levels, FIFO reports a higher gross margin (gross profit/sales). In Year 3 the LIFO liquidation releases older purchase prices previously stored in ending inventory

through cost of goods sold, resulting in a lower cost of goods sold figure and a higher gross profit margin.

MODULE QUIZ 32.1, 32.2

1. Kamp, Inc., sells specialized bicycle shoes. At year-end, due to a sudden increase in manufacturing costs, the replacement cost per pair of shoes is $55. The original cost is $43, and the current selling price is $50. The normal profit margin is 10% of the selling price, and the selling costs are $3 per pair. According to U.S. GAAP, which of the following amounts should each pair of shoes be reported on Kamp's year-end balance sheet?
   A. $42.
   B. $43.
   C. $47.
2. Poulter Products reports under IFRS and wrote its inventory value down from cost of $400,000 to net realizable value of $380,000. The *most likely* financial statement effect of this change is a(n):
   A. increase in cost of sales.
   B. decrease in depreciation charges.
   C. loss reported as other comprehensive income.
3. Which of the following statements relating to U.S. GAAP inventory valuation is *most accurate*?
   A. Companies using FIFO should report inventory in the balance sheet at the lower of cost or market value.
   B. Inventory can be written up, but not by more than it was previously written down.
   C. When establishing market value, net realizable value should be used as the upper limit if replacement cost exceeds net realizable value.
4. Which of the following statements relating to the effects of an inventory write-down is *least accurate*?
   A. Asset turnover will increase.
   B. The quick ratio will decrease.
   C. The debt-to-equity ratio will increase.
5. Under which inventory cost flow assumption does inventory on the balance sheet *best* approximate its current cost?
   A. First-in, first-out.
   B. Weighted average cost.
   C. Last-in, first-out.
6. In periods of rising prices and stable inventory quantities, which of the following *best* describes the effect on gross profit of using LIFO as compared to using FIFO?
   A. Lower.
   B. Higher.
   C. The same.
7. In an inflationary environment, a LIFO liquidation will *most likely* result in an increase in:
   A. inventory.
   B. accounts payable.

C. operating profit margin.

MODULE 32.3: PRESENTATION AND DISCLOSURE

Video covering this content is available online.

LOS 32.c: Describe the presentation and disclosures relating to inventories and explain issues that analysts should consider when examining a company's inventory disclosures and other sources of information.

Inventory disclosures, usually found in the financial statement footnotes, are useful for evaluating the firm's inventory management. The disclosures are also useful for adjusting a firm's financial statements to make them comparable with other firms in the industry.

Required inventory disclosures are similar under U.S. GAAP and IFRS and include the following:

- Cost flow method (LIFO, FIFO, etc.) used
- Total carrying value of inventory, with carrying value by classification (raw materials, work in progress, and finished goods), if appropriate
- Carrying value of inventories reported at fair value less selling costs
- The cost of inventory recognized as an expense (COGS) during the period
- Amount of inventory write-downs (valuation allowances) during the period
- Reversals of inventory write-downs during the period, including a discussion of the circumstances of reversal (IFRS only because U.S. GAAP does not allow reversals)
- Carrying value of inventories pledged as collateral

Inventory Ratios

Merchandising firms, such as wholesalers and retailers, purchase inventory that is ready for sale. In this case, inventory is reported in one account on the balance sheet. Manufacturing firms normally report inventory using three separate accounts: raw materials, work in progress, and finished goods. Analysts can use these disclosures, along with other sources of information such as Management's Discussion and Analysis, economic data specific to the industry, industry trade publications, and other sections of the firm's financial reports, as a signal of a firm's future revenues and earnings.

For example, an increase in raw materials or work in progress inventory may indicate that the firm expects increase in demand. Higher demand should result in higher revenues and earnings. Conversely, an increase in finished goods inventory, while raw materials and work in progress are decreasing, may indicate decreasing demand and potential inventory write-downs in the future.

Analysts should also examine the relationship between sales and finished goods. Finished goods inventory growing faster than sales may indicate declining demand and excessive or potentially obsolete inventory. Obsolete inventory will result in lower

earnings in the future when the inventory is written down. In addition, too much inventory is costly, as the firm may incur storage costs, insurance premiums, and inventory taxes. Holding too much inventory uses cash that might be deployed more efficiently somewhere else.

The inventory turnover ratio measures how quickly a firm is selling its inventory. Generally, high inventory turnover (low days of inventory on hand) is desirable. However, inventory turnover can be too high. A firm with an inventory turnover ratio that is too high may not be carrying enough inventory to satisfy customers' needs, which can cause the firm to lose sales. High inventory turnover may also indicate that inventory write-downs have occurred. Write-downs are usually the result of poor inventory management.

To further assess the explanation for high inventory turnover, we can look at inventory turnover relative to sales growth within the firm and industry. High turnover with slower growth may be a sign of inadequate inventory quantities. Alternatively, sales growth at or above the industry average supports the conclusion that high inventory turnover reflects greater efficiency.

EXAMPLE: Inventory ratio analysis

Hyzer Corporation is a U.S. manufacturer of products for use in the sport of disc golf. Hyzer presents the following financial statements data:

Hyzer Corporation Balance Sheets	20X5 $000	20X6 $000	20X7 $000
Assets			
Cash	950	1,250	2,675
Trade receivables	520	1,520	3,020
Inventories	500	900	300
Total current assets	1,970	3,670	5,995
Gross plant and equipment	5,600	5,400	5,400
Accumulated depreciation	2,400	2,980	3,650
Net plant and equipment	3,200	2,420	1,750
Total assets	5,170	6,090	7,745
Liabilities and equity			
Trade payables	320	220	720
Accrued expenses	75	175	275
Interest payable	45	195	215
Tax payable	80	156	295
Short-term debt	200	120	0
Current liabilities	720	866	1,505
Long-term debt	1,800	1,850	2,150
Common stock	1,000	1,100	1,050
Additional paid-in-capital	500	550	525
Retained earnings	1,150	1,724	2,515
Stockholders' equity	2,650	3,374	4,090
Total liabilities and equity	5,170	6,090	7,745

	20X6 $000	20X7 $000
Revenue	5,500	7,500
Cost of sales	2,600	4,100
Gross profit	2,900	3,400
Operating expenses	1,900	2,150
Operating profit	1,000	1,250
Disposal (loss)/gain	(30)	80
Interest expense	150	200
Earnings before tax	820	1,130
Taxes	246	339
Net income	574	791

20X5 sales = $5,300,000

A review of the footnote disclosure reveals that Hyzer uses FIFO to establish the cost of raw materials. Hyzer records balance sheet inventory values at the lower of cost and NRV.

The following footnote disclosure is given for inventory balances:

Inventory net value	20X5 $000	20X6 $000	20X7 $000
Raw materials	120	207	68
Valuation allowance	−20	−27	−2
Net carrying value	100	180	66
Work in progress	50	95	31
Valuation allowance	0	−5	−1
Net carrying value	50	90	30
Finished goods	403	706	221
Valuation allowance	−53	−76	−17
Net carrying value	350	630	204
Total net carrying value	500	900	300

Use the data in the financial statements to calculate and comment on the following ratios for 20X6 and 20X7:

- Inventory turnover and days of inventory on hand
- Gross profit margin and sales growth
- Current and quick ratios

Answer:

Key ratios summary	20X6	20X7
Inventory turnover	3.7	6.8
Days of inventory on hand	98	53
Gross profit margin	53%	45%
Sales growth	4%	36%
Current ratio	4.24	3.98
Quick ratio	3.20	3.78

Inventory turnover (cost of sales / average inventory):

20X6: $2,600,000 / [($500,000 + $900,000) / 2] = 3.71

20X7: $4,100,000 / [($900,000 + $300,000) / 2] = 6.83

Days of inventory on hand (365 / inventory turnover):

20X6: 365 / 3.71 = 98 days

20X7: 365 / 6.83 = 53 days

Inventory turnover has increased dramatically in 20X7, and as a result, days of inventory on hand has dropped. At first glance, this could be assumed to be due to improvements in working capital management. Inventory balances at year-end have dropped dramatically from $900,000 in 20X6 to $300,000 in 20X7, which is a significant decline—and therefore, is unlikely to be explained purely by improvements in inventory management.

The decrease in inventory balances could be misinterpreted as indicating that the company expects demand for its products to decline significantly. The inventory

disclosure shows that raw materials, work in progress, and finished goods have declined substantially in 20X7. Typically, if customer demand declined significantly, we would expect raw materials and work in progress to decline relative to finished goods. This indicates that raw materials were 20% of inventory in 20X6 ($180,000 / $900,000) and 22% in 20X7 ($66,000 / $300,000), while work in progress was 10% in 20X6 ($90,000 / $900,000) and remained at 10% in 20X7 ($30,000 / $300,000). Raw materials and work in progress have not declined proportionately relative to finished goods. This indicates that lower future demand is not expected.

Another clue for the analyst is that the valuation allowance for finished goods has decreased as a proportion of the cost of finished goods, rather than increased.

$$\text{20X6: } \$76{,}000 / \$706{,}000 = 10.7\%$$

$$\text{20X7: } \$17{,}000 / \$221{,}000 = 7.7\%$$

If product obsolescence due to expected future decreases in sales was a significant factor, the valuation allowance for finished goods should have increased proportionally. Remember that the valuation allowance indicates that NRV has declined below cost.

These factors combined indicate to the analyst that slowing customer demand and obsolescence is not the reason for the dramatic decline in 20X7 ending inventory.

Looking at sales growth, the analyst can see a significant increase in 20X7:

$$\text{20X6: } (\$5{,}500{,}000 / \$5{,}300{,}000) - 1 = 3.77\%$$

$$\text{20X7: } (\$7{,}500{,}000 / \$5{,}500{,}000) - 1 = 36.36\%$$

It would seem unlikely (but not impossible) that a company seeing such increases in sales would be facing a dramatic decline in the next period. This is another indicator that the declining inventory balances are not caused by obsolescence or falling demand.

Gross profit margins, however, did decline in 20X7, suggesting that the cost of raw materials, manufacturing costs, or both increased:

$$\text{20X6: } \$2{,}900{,}000 / \$5{,}500{,}000 = 52.73\%$$

$$\text{20X7: } \$3{,}400{,}000 / \$7{,}500{,}000 = 45.33\%$$

Positive sales growth, coupled with declining margins, shows that the cost of producing disc golf products has increased. This, coupled with the decline in inventory balances in 20X7, could indicate that the company is facing supply-side shocks. Declining margins reinforce the suspicion that the significant drop in inventory levels is unlikely to be solely explained by efficiency improvements. The sales growth of 36% in 20X7 should also make the analyst question why inventory balances have declined so substantially.

The analyst should seek out further explanation for the decline. Potential sources are as follows:

- Management discussion and analysis

- Significant events disclosed in the accounts
- Conferences and communication with the senior management
- Media and industry reports and journals
- The accounts of companies in the same industry

Looking at Hyzer's liquidity, the current ratio declined between 20X6 and 20X7 while the quick ratio improved. The major difference between the two measures is the inclusion of inventory in the current ratio.

Current ratio: (current assets / current liabilities)

20X6: $3,670,000 / $866,000 = 4.24

20X7: $5,995,000 / $1,505,000 = 3.98

Quick ratio: (cash + market securities + receivables) / current liabilities

20X6: $2,770,000 / $866,000 = 3.20

20X7: $5,695,000 / $1,505,000 = 3.78

Some analysts prefer the quick ratio because it removes the impact of inventory on liquidity. Inventory is one of the most illiquid of current assets, as there can be a significant delay (days of inventory on hand + days sales outstanding) between holding inventory and receiving cash. Using this measure, Hyzer's liquidity shows a moderate improvement.

MODULE QUIZ 32.3

1. Which of the following inventory disclosures would *least likely* be found in the footnotes of a firm following IFRS?
   A. The amount of loss reversals, from previously written-down inventory, recognized during the period.
   B. The carrying value of inventories that collateralize a short-term loan.
   C. The separate carrying values of raw materials, work in progress, and finished goods computed under the LIFO cost flow method.

2. Paul Neimer calculates the following horizontal common-size inventory data for Redpine Manufacturing, Inc.:

	Year 1	Year 2	Year 3	Year 4
Sales	1.00	1.10	1.18	1.25
Inventories:				
Raw materials	1.00	1.09	1.07	1.04
Work in progress	1.00	1.11	1.15	1.17
Finished goods	1.00	1.10	1.21	1.33

   Based on these data, Neimer should *most likely* conclude that Redpine:
   A. has an increasing inventory turnover ratio.
   B. anticipates declining demand for its products.
   C. might be losing sales due to inadequate inventory.

3. Which of the following is *most likely* for a firm with high inventory turnover and lower sales growth than the industry average? The firm:

A. is managing its inventory effectively.
B. may have obsolete inventory that requires a write-down.
C. may be losing sales by not carrying enough inventory.

4. During a period of increasing prices, compared to reporting under LIFO, a firm that reports using FIFO for inventory will have a:

A. lower gross margin.
B. higher current ratio.
C. higher asset turnover.

KEY CONCEPTS

LOS 32.a

Under IFRS, inventories are valued at the lower of cost or net realizable value (NRV). Inventory write-ups are allowed, but only to the extent that a previous write-down to NRV was recorded.

Under U.S. GAAP, inventories are valued at the lower of cost or NRV for companies using cost methods other than LIFO or the retail method. For companies using LIFO or the retail method, inventories are valued at the lower of cost or market. Market is usually equal to replacement cost, but it cannot exceed NRV or be less than NRV minus a normal profit margin. No subsequent write-up is allowed for any company reporting under U.S. GAAP.

A write-down of inventory value from cost to NRV will do the following:

- Decrease inventory, assets, and equity. A contra account (valuation allowance) is used to reduce the carrying value of inventory and most often increase cost of sales. If the write-down is materially large, it will be disclosed on the face of the income statement as its own line item.
- Increase asset turnover, the debt-to-equity ratio, and the debt-to-assets ratio.
- Decrease net income and the net profit margin, as well as ROA and ROE for a typical firm.

LOS 32.b

In periods where inventory levels and purchase costs are rising, the following occur:

- FIFO produces the highest ending inventory value and the lowest cost of sales.
- Average cost will produce ending inventory and cost of sales between LIFO and FIFO.
- LIFO produces the lowest ending inventory and the highest cost of sales.
- FIFO results in higher profitability and liquidity ratios, and lower inventory turnover and solvency ratios.
- If inventory levels are increasing but costs are decreasing, these results are reversed.

If LIFO is used and inventory levels decline, a LIFO liquidation has occurred, which will distort profit margins in that period.

Analysts may have to adjust financial statements to compare firms that use different inventory cost methods.

LOS 32.c

Required inventory disclosures areas are as follows:

- The cost flow method (LIFO, FIFO, etc.) used
- Total carrying value of inventory and carrying value by classification (raw materials, work in progress, and finished goods), if appropriate
- Carrying value of inventories reported at fair value less selling costs
- The cost of inventory recognized as an expense (COGS) during the period
- Amount of inventory write-downs during the period
- Reversals of inventory write-downs during the period (IFRS only because U.S. GAAP does not allow reversals)
- Carrying value of inventories pledged as collateral

An analyst should examine inventory disclosures to determine the following:

- Whether the finished goods category is growing while raw materials and goods in process are declining, which may indicate decreasing demand and potential future inventory write-downs
- Whether raw materials and goods in process are increasing, which may indicate increasing future demand and higher earnings
- Whether increases in finished goods are greater than increases in sales, which may indicate decreasing demand or inventory obsolescence and potential future inventory write-downs

Inventory turnover, days of inventory on hand, and gross profit margin can be used to evaluate the quality of a firm's inventory management:

- Inventory turnover that is too low (high days of inventory on hand) may be an indication of slow-moving or obsolete inventory.
- High inventory turnover, together with low sales growth relative to the industry, may indicate inadequate inventory levels and lost sales because customer orders could not be fulfilled.
- High inventory turnover, together with high sales growth relative to the industry average, suggest that high inventory turnover reflects greater efficiency rather than inadequate inventory.

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 32.1, 32.2

1. **B** Market is equal to the replacement cost as long as replacement cost is within a specific range. The upper bound is net realizable value (NRV), which is equal to the selling price ($50) less selling costs ($3) for an NRV of $47. The lower bound is NRV ($47) less normal profit margin (10% of selling price = $5) for a net amount of $42. Since replacement cost is greater than NRV ($47), market equals

NRV ($47). Additionally, we have to use the lower of cost ($43) or market ($47) principle, so the shoes should be recorded at cost of $43. (Module 32.1, LOS 32.a)

2. **A** The write-down in inventory value from cost to NRV is reported on the income statement either as an addition to cost of sales or as a separate line item, not as other comprehensive income. Depreciation will not be affected as inventory is not depreciated. (Module 32.1, LOS 32.a)

3. **C** When establishing market value, replacement cost should be used subject to upper and lower limits. The upper limit is net realizable value, and the lower limit is net realizable value minus the normal profit margin. The lower of cost or market value is only applicable to companies using either the LIFO or retail sales method. Companies using specific identification, FIFO, or average cost should use the lower of cost or NRV. Inventory write-downs under U.S. GAAP cannot be reversed. (Module 32.1, LOS 32.a)

4. **B** The quick ratio [(cash + receivables + marketable securities) / current liabilities] will not be affected because the numerator does not include inventory. Inventory write-downs will decrease the carrying value of inventory in the balance sheet, reducing current and total assets. The write-down will decrease income for the period. Asset turnover (revenue / average total assets) will increase as revenue (sales) is not affected, but balance sheet assets decline. The debt-to-equity ratio (interest-bearing liabilities / stockholders' equity) will increase as the write-down reduces net income and therefore retained earnings and stockholders' equity. (Module 32.1, LOS 32.a)

5. **A** Under FIFO, ending inventory is made up of the most recent purchases, thereby providing a closer approximation of current cost. (Module 32.2, LOS 32.b)

6. **A** Compared to FIFO, COGS calculated under LIFO will be higher because the most recent, higher-cost units are assumed to be the first units sold. Higher COGS under LIFO will result in lower gross profit (revenue – COGS). (Module 32.2, LOS 32.b)

7. **C** In a LIFO liquidation, older and lower costs are included in cost of sales. Thus, cost of sales per unit decreases and profit margins increase. (Module 32.2, LOS 32.b)

Module Quiz 32.3

1. **C** While the separate carrying values of raw materials, work in progress, and finished goods are required disclosure for some firms, LIFO is not permitted under IFRS. (LOS 32.c)

2. **B** Redpine's finished goods inventory is growing faster than sales, while work in progress inventory is growing more slowly than sales and raw materials inventory is decreasing. These data are consistent with Redpine reducing production in response to decreasing demand. Inventory turnover ratios cannot be calculated directly from the common-size data given, but finished goods

inventory increasing faster than sales suggests inventory turnover is likely decreasing. (LOS 32.c)

3. **C** High inventory turnover coupled with low sales growth relative to the industry may be an indication of inadequate inventory levels. In this case, the firm may be losing sales by not carrying enough inventory. (LOS 32.c)

4. **B** Compared to using LIFO, using FIFO would produce lower COGS, higher gross operating income, and higher ending inventory, so current assets and the current ratio would be higher. Consequently, gross margin would be higher and asset turnover would be lower under the FIFO inventory method. (LOS 32.c)

READING 33

ANALYSIS OF LONG-TERM ASSETS

INTRODUCTION

Before studying this reading, ensure you have reviewed capitalization versus expensing costs in our reading on Analyzing Income Statements and understand the implications of these approaches on the financial statements. You should also understand the various types of long-term assets, PP&E, and intangibles (from our reading on Understanding Balance Sheets and the prerequisites). Ensure you have understood the two models of recording assets in the balance sheet. Under U.S. GAAP, the cost method is required. IFRS allows companies to choose either the cost method or revaluation model for each class of asset. You should also ensure you understand depreciation and amortization methods (prerequisites).

MODULE 33.1: INTANGIBLE LONG-LIVED ASSETS

Video covering this content is available online.

LOS 33.a: Compare the financial reporting of the following types of intangible assets: purchased, internally developed, and acquired in a business combination.

Intangible assets are long-term assets that lack physical substance, such as patents, brand names, copyrights, and franchises. Some intangible assets have finite lives, while others have indefinite lives.

The cost of a finite-lived intangible asset is amortized over its useful life. Indefinite-lived intangible assets are not amortized, but they are tested for impairment at least annually. If impaired, the reduction in value is recognized in the income statement as a loss in the period in which the impairment is recognized.

Intangible assets are also considered either identifiable or unidentifiable. Under IFRS, an **identifiable intangible asset** must be the following:

- Capable of being separated from the firm or arise from a contractual or legal right
- Controlled by the firm
- Expected to provide future economic benefits

In addition, the future economic benefits must be probable, and the asset's cost must be reliably measurable.

An **unidentifiable intangible asset** is one that cannot be purchased separately and may have an indefinite life. The most common example of an unidentifiable intangible asset is goodwill. Goodwill is the excess of purchase price over the fair value of the identifiable assets (net of liabilities) acquired in a business combination.

Not all intangible assets are reported on the balance sheet. Accounting for an intangible asset depends on whether the asset was created internally, purchased externally, or obtained as part of a business combination.

Intangible Assets Created Internally

With some exceptions, costs to create intangible assets are expensed as incurred. Important exceptions are research and development costs (under IFRS) and software development costs.

Under IFRS, **research costs**, which are costs aimed at the discovery of new scientific or technical knowledge and understanding, are expensed as incurred. However, **development costs** may be capitalized. Development costs are incurred to translate research findings into a plan or design of a new product or process. To recognize an intangible asset in development, a firm must show that it can complete the asset and intends to use or sell the completed asset, among other criteria.

Under U.S. GAAP, both research and development costs are generally expensed as incurred. However, the costs of creating software for sale to others are treated in a manner similar to the treatment of research and development costs under IFRS. Costs incurred to develop software for sale to others are expensed as incurred until the product's technological feasibility has been established, after which the costs of developing a salable product are capitalized. Costs incurred developing software for internal use must be expensed until it is probable that the firm will complete the project and use the software as intended. Technological feasibility is more difficult to demonstrate than the probability of completing and using the software.

Purchased Intangible Assets

Like tangible assets, an intangible asset purchased from another party is initially recorded on the balance sheet at cost, typically its fair value at acquisition.

If the intangible asset is purchased as part of a group, the total purchase price is allocated to each asset on the basis of its fair value. For analytical purposes, an analyst is usually more interested in the type of asset acquired rather than the value assigned on the balance sheet. For example, recently acquired franchise rights may provide insight into the firm's future operating performance. In this case, the allocation of cost is not as important.

The financial statement effects of capitalizing intangible assets are the same as the effects of capitalizing other expenditures. Capitalizing results in higher net income in the first year and lower net income in the subsequent years. Similarly, assets, equity, and operating cash flow are all higher when expenditures are capitalized.

A company that generates its intangible assets internally will have lower balance sheet assets than a company that purchases its intangibles. Internally generated intangibles are typically expensed, while purchased intangibles are capitalized. This can have a considerable impact on financial statements and ratios.

Intangible Assets Obtained in a Business Combination

The **acquisition method** is used to account for business combinations. Under the acquisition method, the purchase price is allocated to the identifiable assets and liabilities of the acquired firm on the basis of fair value. This will involve establishing the fair value of any intangibles that the acquired company had internally developed and including them in the balance sheet at the date of acquisition. To capitalize these intangible assets, which had previously expensed as incurred, the asset must be an identifiable intangible asset. Any remaining amount of the purchase price is recorded as **goodwill** (see Figure 33.1). Goodwill is said to be an unidentifiable asset that cannot be separated from the business itself.

Figure 33.1: Goodwill

Purchase price	X
Fair market value of net assets acquired	(X)
Fair market value of identifiable intangibles previously not recognized	(X)
Goodwill	X

Only goodwill created in a business combination is capitalized on the balance sheet. The costs of any internally generated "goodwill" are expensed in the period incurred.

MODULE QUIZ 33.1

1. The cost of an intangible asset is *most likely* to be amortized if the asset has a(n):
   A. finite life and was purchased.
   B. finite life and was created internally.
   C. indefinite life and was acquired in a business combination.
2. StefoJo, PLC, is acquiring a controlling interest in Dykes Limited. Dykes has internally developed intangibles that have previously been expensed. Which of the following comments is *most accurate*?
   A. StefoJo should capitalize any identifiable internally generated intangibles.
   B. Goodwill generated resulting from Dykes' reputation and customer loyalty should be capitalized.
   C. Capitalizing intangible assets Dykes had previously expensed will increase the goodwill recorded at the acquisition date.
3. Ferdinand, Inc., is developing software for internal use within its business operations. Assuming Ferdinand follows U.S. GAAP, which of the following statements is *least accurate*?
   A. The software development costs can only be capitalized once the software is technically feasible.
   B. Capitalized software development will increase earnings in the year of capitalization but reduce earnings in subsequent periods.

C. The software development costs should be capitalized once it is probable that the software will be completed and used as intended.

MODULE 33.2: IMPAIRMENT AND DERECOGNITION

Video covering this content is available online.

LOS 33.b: Explain and evaluate how impairment and derecognition of property, plant, and equipment and intangible assets affect the financial statements and ratios.

Depreciation and amortization represent the spreading of an asset's cost to match the benefits earned over an asset's life, and they cause the balance sheet carrying value to decline. An **impairment** is an unanticipated decline in an asset's value, causing it to fall below the carrying value. **Derecognition** occurs when an asset is disposed of or retired.

Impairments

Both IFRS and U.S. GAAP require firms to write down impaired assets by recognizing a loss in the income statement, but the standards are applied slightly differently. If the impairment loss is material in size and nature, it will be shown as an unusual or infrequent item.

PROFESSOR'S NOTE
The following discussion applies to both tangible and intangible long-lived assets with finite lives that are held for use.

Impairments Under IFRS

Under IFRS, the firm must annually assess whether events or circumstances indicate that an impairment of an asset's value has occurred. For example, there may have been a significant decline in the market value of the asset, or a significant change in the asset's physical condition. If so, the asset's value must be tested for impairment.

An asset is impaired when its carrying value (original cost less accumulated depreciation) exceeds the **recoverable amount**. The recoverable amount is the greater of its fair value less any selling costs and its **value in use**. The value in use is the present value of its future cash flow stream from continued use and disposal. Value in use is a highly subjective figure requiring estimation of future cash flows, disposal proceeds, and the selection of an appropriate discount rate.

If impaired, the asset's value must be written down on the balance sheet to the recoverable amount. An impairment loss, equal to the excess of carrying value over the recoverable amount, is recognized in the income statement.

Under IFRS, an impairment loss on an identifiable long-lived asset can be reversed if the asset's value recovers in the future. However, the loss reversal is limited to the original impairment loss.

Impairments Under U.S. GAAP

Under U.S. GAAP, an asset is tested for impairment only when events and circumstances indicate the firm may not be able to recover the carrying value through future use.

Determining an impairment and calculating the loss potentially involve two steps. In the first step, the asset is tested for impairment by applying a **recoverability test**. If the asset is impaired, the second step involves measuring the loss.

Regarding *recoverability*, an asset is considered impaired if the carrying value (original cost less accumulated depreciation) is greater than the asset's future *undiscounted* cash flow stream. Because the recoverability test is based on estimates of future undiscounted cash flows, tests for impairment involve considerable management discretion. Like value in use under IFRS, estimating the future undiscounted cash flows from an asset's use and disposal is highly subjective.

Regarding *loss measurement*, if impaired, the asset's value is written down to fair value on the balance sheet—and a loss, equal to the excess of carrying value over the fair value of the asset (or the *discounted* value of its future cash flows, if the fair value is not known), is recognized in the income statement. The discounted value of future cash flows is equivalent of value in use under IFRS.

Under U.S. GAAP, loss recoveries are typically not permitted.

PROFESSOR'S NOTE

The difference between testing for impairment and measuring the impairment loss can be confusing. In testing for impairment under U.S. GAAP, undiscounted cash flows are used. Once impairment has been detected, the loss is based on fair value, or the discounted expected future cash flows. Using undiscounted cash flows to test for impairment keeps PP&E assets from becoming "impaired" by increases in the discount rate when interest rates increase. In measuring the impairment loss, U.S. GAAP uses fair value, not fair value less selling costs.

EXAMPLE: Asset impairment

Information related to equipment owned by Brownfield Company follows:

Original cost	$900,000
Accumulated depreciation to date	$100,000
Expected future cash flows	$795,000
Fair value	$790,000
Value in use	$785,000
Selling costs	$30,000

Assuming Brownfield will continue to use the equipment, test the asset for impairment under both IFRS and U.S. GAAP and discuss the results.

Answer:

The carrying value of the equipment is $900,000 original cost − $100,000 accumulated depreciation = $800,000, and the recoverable amount under IFRS is $785,000 (greater of $785,000 value in use and $760,000 fair value less selling costs). Under IFRS, the asset is written down on the balance sheet to the $785,000 recoverable amount, and a $15,000 loss ($800,000 carrying value − $785,000 recoverable amount) is recognized in the income statement.

Under U.S. GAAP, the asset is impaired because the $795,000 expected future cash flows is less than the $800,000 carrying value. The asset is written down on the balance sheet to its $790,000 fair value, and a $10,000 loss ($800,000 carrying value − $790,000 fair value) is recognized on the income statement.

Impairment reduces an asset's carrying value on the balance sheet. An impairment charge is recognized as a loss in the income statement, reducing assets and equity (retained earnings). In the year of impairment, return on assets (ROA) and return on equity (ROE) will decrease because the impairment charge reduces net income.

In subsequent periods, net income will be higher than it would have been without the impairment charge because depreciation or amortization will be lower (the asset has a lower depreciable value). Both ROA and ROE will increase in periods after the impairment charge because both equity and assets will fall as a result of the impairment charge. Asset turnover will increase in the period in which the impairment charge is taken, and in subsequent periods.

Asset impairment has no impact on cash flow because the impairment does not reduce taxable income; it is an unrealized loss until the asset is disposed of.

Analysis of Impairments

An impairment loss essentially indicates that the firm has not recognized sufficient depreciation or amortization expense, and has overstated earnings as a result.

The judgment required in determining asset impairments gives management considerable discretion about the timing and amounts of impairment charges. Consequently, impairment decisions present an opportunity for management to manipulate earnings. Waiting to recognize an impairment loss until a period of relatively high earnings would tend to smooth earnings.

Alternatively, existing managements may take more impairment charges in periods when earnings will be poor due to external (macroeconomic or industry) factors. New managements may also choose to take more or greater impairment charges when they take over. In either case, the resulting low earnings might not be perceived as the "fault" of management, and lower values for assets and equity give a boost to ROA and ROE going forward.

Intangible Assets With Indefinite Lives

Intangible assets with indefinite lives are not amortized; rather, they are tested for impairment at least annually. An impairment loss is recognized when the carrying amount exceeds fair value.

Long-Lived Assets Held for Sale

If a firm intends to sell an asset, it is probable that the asset will be sold, and the asset is available for immediate sale, then it must be reclassified from *held for use* to *held for sale*. When a firm reclassifies an asset as held for sale, the asset is no longer depreciated or amortized. The held-for-sale asset is impaired if its carrying value exceeds its fair value less selling costs. If impaired, the asset is written down to net realizable value, and the loss is recognized in the income statement.

For long-lived assets held for sale, the loss can be reversed under IFRS and U.S. GAAP if the value of the asset recovers in the future. However, the loss reversal is limited to the original impairment loss. Thus, the carrying value of the asset after reversal cannot exceed the carrying value before the impairment was recognized.

Derecognition

Eventually, long-term assets are removed from the balance sheet. Derecognition occurs when assets are sold, exchanged, or abandoned.

When a long-term asset is sold, the asset is removed from the balance sheet and the difference between the sale proceeds and the carrying value of the asset is reported as a gain or loss in the income statement, as seen in Figure 33.2. The carrying value is equal to original cost minus accumulated depreciation and any impairment charges.

Figure 33.2: Derecognition of Long-Term Assets

Disposal proceeds	X	Cash flow from investing
Carrying value before disposal	(X)	Removed from balance sheet
Disposal gain (loss)	X/(X)	Accounting gain or (loss) in income statement

The gain or loss is reported in the income statement with other gains and losses, or reported separately as an unusual or infrequent item if material. Also, if the firm presents its cash flow statement using the indirect method, the gain or loss is removed from net income to compute cash flow from operations because the proceeds from selling a long-lived asset are an investing cash inflow.

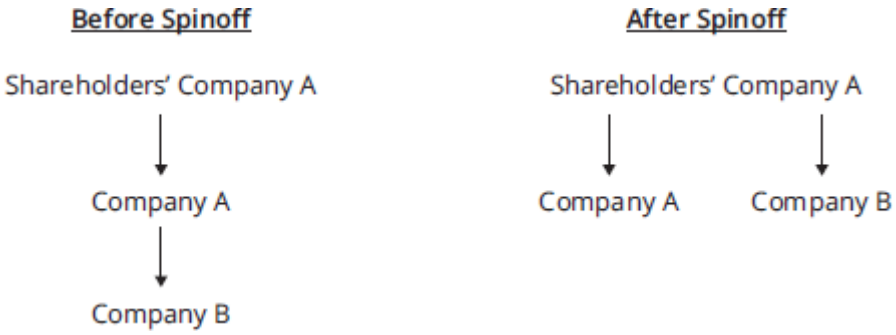
If a long-lived asset is abandoned, the treatment is similar to a sale, except there are no proceeds. In this case, the carrying value of the asset is removed from the balance sheet, and a loss of that amount is recognized in the income statement.

If a long-lived asset is exchanged for another asset, a gain or loss is computed by comparing the carrying value of the old asset with fair value of the old asset (or the fair value of the new asset, if that value is clearly more evident). The carrying value of the old asset is removed from the balance sheet, and the new asset is recorded at its fair

value. If no reliable measure of fair value exists, the new asset is valued at the carrying value of the old asset.

A **spinoff** is the transfer of assets that constitute an entire division or subsidiary into a new legal entity, upon which the shares of the spinnee are subsequently distributed to its shareholders, and the shareholders do not surrender any stock of the spinnor.[1] See Figure 33.3 as follows.

Figure 33.3: Spinoff



Before the spinoff, Company A (the spinnor) owns Company B (the spinnee), and shareholders just have shares in Company A. After the spinoff, the shareholders have shares in both Company A and Company B. Company B is no longer included in the consolidated accounts of Company A.

Once the spinoff becomes probable, the balance sheet assets and liabilities of the spinnee will be transferred from assets held for use to assets held for sale in the spinnor's accounts. Assets held for sale may be referred to as assets held for distribution, in this context. No profit or loss is recorded on the disposal in the income statement.

MODULE QUIZ 33.2

1. According to U.S. GAAP, an asset is impaired when:

   A. the firm cannot fully recover the carrying amount of the asset through operations.
   B. accumulated depreciation plus salvage value exceeds acquisition cost.
   C. the present value of future cash flows from an asset exceeds its carrying value.

2. Using the following data, what is the income statement difference between an impairment recorded under U.S. GAAP and an impairment recorded under IFRS?

Original cost	$250,000
Accumulated depreciation to date	$150,000
Expected future cash flows	$105,000
Fair value	$95,000
Value in use	$90,000
Selling costs	$10,000

   A. $0.
   B. $5,000.

C. $10,000.

3. In the year after an impairment charge on a finite-lived identifiable intangible asset, compared to not taking the charge, net income is *most likely* to be:

   A. lower.
   B. higher.
   C. unaffected.

4. A firm recently recognized a $15,000 loss on the sale of machinery used in its manufacturing operation. The original cost of the machinery was $100,000 and the accumulated depreciation at the date of sale was $60,000. What amount did the firm receive from the sale?

   A. $25,000.
   B. $45,000.
   C. $85,000.

5. Other things equal, which of the following actions related to property, plant, and equipment will *most likely* decrease a firm's return on assets (ROA) in future periods?

   A. Impairment.
   B. Derecognition.
   C. Upward revaluation.

6. Sinclair S.r.l. has recently exchanged an old asset for a new asset. Which of the following comments is *least accurate*?

   A. The difference between the fair value and the carrying value of the disposed asset will be recognized in the income statement as a gain or loss.
   B. The new asset will be recorded in the balance sheet at the fair value of the assets disposed of.
   C. If the fair value of the asset received and the fair value of the asset disposed of cannot be established, a disposal loss will be recorded in the income statement equal to the carrying value of the disposed asset.

MODULE 33.3: LONG-TERM ASSET DISCLOSURES

Video covering this content is available online.

LOS 33.c: Analyze and interpret financial statement disclosures regarding property, plant, and equipment and intangible assets.

IFRS Disclosures

Under IFRS, the firm must disclose the following for each class of property, plant, and equipment (PP&E):

- Basis for measurement (usually historical cost)
- Depreciation method
- Depreciation expense in the period
- Useful lives or depreciation rate
- Gross carrying value and accumulated depreciation at the start and end of the period
- Reconciliation of carrying amounts from the beginning of the period to the end of the period

The firm must also disclose the following:

- Title restrictions and assets pledged as collateral
- Agreements to acquire PP&E in the future

If the revaluation (fair value) model is used, the firm must disclose the following:

- The revaluation date
- How fair value was determined
- Carrying value using the historical cost model
- Revaluation surplus in other comprehensive income (OCI)

Under IFRS, the disclosure requirements for intangible assets are similar to those for PP&E, except that the firm must disclose whether the useful lives are finite or indefinite.

For impaired assets, the firm must disclose the following:

- Amounts of impairment losses and reversals by asset class
- Where the losses and loss reversals are recognized in the income statement
- Circumstances that caused the impairment loss or reversal

U.S. GAAP Disclosures

Under U.S. GAAP, the PP&E disclosures include the following:

- Depreciation expense by period
- Balances of major classes of assets by nature and function, such as land, improvements, buildings, machinery, and furniture
- Accumulated depreciation by major classes, or in total
- General description of depreciation methods used

Under U.S. GAAP, the disclosure requirements for intangible assets are similar to those for PP&E. In addition, the firm must provide an estimate of amortization expense for the next five years.

For impaired assets, the firm must disclose the following:

- A description of the impaired asset
- Circumstances that caused the impairment
- How fair value was determined
- The amount of loss
- Where the loss is recognized in the income statement

Under IFRS, the depreciation and amortization expenses may be shown on the face of the income statement if producing an income statement using the nature of the expense approach. If the company prepares the income statement using the function of the expense method, it will not be shown on the face; instead, it will be included in the cost of sales and sales general and admin. If the indirect method is used to produce cash

flow from operations, depreciation and amortization will appear as noncash charges. For companies adopting the direct method, depreciation will not appear in the computation of operating cash flows; however, U.S. GAAP requires the indirect method reconciliation of net income to operating cash flows to be disclosed in the footnotes. Cash received on asset disposals and spent on asset acquisitions are presented as cash flows from investing activities.

Analyzing Long-Lived Asset Disclosures

Fixed-asset turnover shows revenue per dollar of fixed assets and indicates how efficiently a firm is using its long-term assets to generate sales. A higher ratio is interpreted as greater efficiency.

$$\text{fixed asset turnover} = \text{revenue} \;/\; \text{average fixed assets}$$

Financial statement disclosures provide an analyst considerable information about a company's fixed assets and depreciation (amortization) methods. An analyst can use the data to estimate the average age of the firm's assets. The average age is useful for two reasons:

1. Older, less-efficient assets may make a firm less competitive.
2. The average age of assets helps an analyst to estimate the timing of major capital expenditures and a firm's future financing requirements.

The level of detail provided in footnote disclosures regarding fixed assets and depreciation varies across firms. Because assets are often grouped by their useful lives, the following methods of estimating the average age, economic life, and remaining useful life of a firm's assets do not produce precise values, but they can highlight issues for further investigation. The following computations assume zero salvage values and straight-line depreciation, and as a result, they are less insightful for asset classes subject to accelerated depreciation methods and substantial salvage values.

Three useful calculations (in years) for an analyst are as follows.

Average Age

$$\text{average age} = \frac{\text{accumulated depreciation}}{\text{annual depreciation expense}}$$

This calculation is more accurate for a firm that uses straight-line depreciation. The calculation can be significantly affected by the mix of assets.

Total Useful Life

$$\text{total useful life} = \frac{\text{historical cost (gross cost)}}{\text{annual depreciation expense}}$$

Historical cost is gross PP&E before deducting accumulated depreciation.

Remaining Useful Life

$$\text{remaining useful life} = \frac{\text{ending net PP\&E}}{\text{annual depreciation expense}}$$

Net PP&E is equal to original cost (gross PP&E) minus accumulated depreciation.

PROFESSOR'S NOTE
The remaining useful life can also be approximated by subtracting the average age from the average depreciable life.

EXAMPLE: Calculating average age and total useful life

At the end of 20X8, a company has gross PP&E of $3 million and accumulated depreciation of $1 million. During the year, the depreciation expense was $500,000.

What is the average age, total useful life, and remaining useful life of the company's PP&E?

Answer:

$$\text{average age} = \frac{\text{accumulated depreciation}}{\text{depreciation expense}} = \frac{\$1{,}000{,}000}{\$500{,}000} = 2 \text{ years}$$

$$\text{total useful life} = \frac{\text{historical cost}}{\text{depreciation expense}} = \frac{\$3{,}000{,}000}{\$500{,}000} = 6 \text{ years}$$

$$\text{remaining useful life} = \frac{\text{ending net PP\&E}}{\text{depreciation expense}} = \frac{\$2{,}000{,}000}{\$500{,}000} = 4 \text{ years}$$

Another popular metric is the ratio of annual capital expenditures to depreciation expense. This ratio provides information about whether the firm is maintaining its production capacity by replacing its PP&E at the same rate as its assets are being depreciated.

MODULE QUIZ 33.3

1. Which of the following disclosures would *least likely* be found in the financial statement footnotes of a firm?
   A. Accumulated depreciation.
   B. Carrying values by asset class.
   C. Average age of assets.
2. Metallurgy, Inc., reported depreciation expense of $15 million for the most recent year. Beginning-of-year gross PP&E and accumulated depreciation were $287 million and $77 million, respectively. If end-of year gross PP&E and accumulated depreciation were $300 million and $80 million, the estimated remaining useful life of PP&E is *closest* to:
   A. 10 years.
   B. 15 years.
   C. 20 years.
3. Ruby, Inc., reported depreciation expense of $90 million for the most recent year. Beginning-of-year gross PP&E and accumulated depreciation were $300 million and $120 million, respectively. If end-of year gross PP&E and accumulated depreciation were $350 million and $200 million, the estimated average age of PP&E is *closest* to:
   A. 1.3 years.
   B. 1.6 years.
   C. 2.2 years.
4. For impairments, U.S. GAAP *least likely* requires firms to disclose:

A. amounts of impairment reversals by asset class.
B. how fair value was determined.
C. circumstances that led to the impairment.

KEY CONCEPTS

LOS 33.a

The cost of a purchased finite-lived intangible asset is amortized over its useful life. Indefinite-lived intangible assets are not amortized, but they are tested for impairment at least annually. The cost of internally developed intangible assets is expensed.

Under IFRS, research costs are expensed, but development costs may be capitalized. Under U.S. GAAP, both research and development costs are expensed as incurred, except in the case of software.

The acquisition method is used to account for assets acquired in a business combination. The purchase price is allocated to the fair value of identifiable assets of the acquired firm less its liabilities. Any excess of the purchase price above the fair value of the acquired firm's net assets is recorded as goodwill, an unidentifiable intangible asset that cannot be separated from the business itself.

Compared to expensing an asset's cost, capitalization results in the following:

- Lower expense and higher net income in period of acquisition, and higher expense (depreciation or amortization) and lower net income in each of the remaining years of the asset's life
- Higher assets and equity
- Lower CFI and higher CFO because the cost of a capitalized asset is classified as an investing cash outflow
- Higher ROE and ROA in the initial period, and lower ROE and ROA in subsequent periods because net income is lower, and both assets and equity are higher
- Lower debt-to-assets and debt-to-equity ratios because assets and equity are higher

LOS 33.b

Impairment charges decrease net income, assets, and equity, which results in lower ROA and ROE and higher debt-to-equity and debt-to-assets ratios for a typical firm.

Under IFRS, an asset is impaired when its carrying value exceeds the recoverable amount. The recoverable amount is the greater of fair value less selling costs and the value in use (present value of expected cash flows). If impaired, the asset is written down to the recoverable amount. Loss recoveries are permitted, but not above historical cost.

Under U.S. GAAP, an asset is impaired if its carrying value is greater than the asset's undiscounted future cash flows. If impaired, the asset is written down to its fair value. Subsequent recoveries are not allowed for assets held for use.

Asset impairments result in losses in the income statement. Impairments have no impact on cash flow, as they have no tax or other cash flow effects until disposal of the

asset.

Derecognition of assets can result in either a gain or loss on the income statement. A loss will reduce net income and assets, while a gain will increase net income and assets.

When a long-lived asset is *sold*, the difference between the sale proceeds and the carrying (book) value of the asset is reported as a gain or loss in the income statement.

When a long-lived asset is *abandoned*, the carrying value is removed from the balance sheet, and a loss is recognized in that amount.

If a long-lived asset is *exchanged* for another asset, a gain or loss is computed by comparing the carrying value of the old asset with fair value of the old asset (or fair value of the new asset, if more clearly evident).

LOS 33.c

There are differences in the disclosure requirements for long-lived assets under IFRS and U.S. GAAP. However, firms are generally required to disclose the following:

- Carrying values for each class of asset
- Accumulated depreciation and amortization
- Title restrictions and assets pledged as collateral
- For impaired assets, the loss amount and the circumstances that caused the loss
- For revalued assets (IFRS only), the revaluation date, how fair value was determined, and the carrying value using the historical cost model

Analysts can use disclosures of the historical cost, accumulated depreciation (amortization), and annual depreciation (amortization) expense to estimate average age of assets, total useful life of assets, and remaining useful life of assets.

$$\text{average age} = \frac{\text{accumulated depreciation}}{\text{annual depreciation expense}}$$

$$\text{total useful life} = \frac{\text{historical cost}}{\text{annual depreciation expense}}$$

$$\text{remaining useful life} = \frac{\text{ending net PP\&E}}{\text{annual depreciation expense}}$$

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 33.1

1. **A** The cost of an intangible asset is amortized if the asset has a finite life and was purchased or acquired in a business combination. Development costs for internally generated intangible assets may be capitalized under IFRS, but research costs are expensed as incurred. (LOS 33.a)

2. **A** Any identifiable internally generated intangible assets that the targeted company had previously expensed must be included in the balance sheet assets acquired. Internally generated goodwill is not an identifiable intangible asset and would not

be included in the fair market value of assets acquired. The capitalization of previously unrecognized identifiable intangibles will increase the fair market value of assets acquired and reduce the amount of the purchase price allocated to goodwill. (LOS 33.a)

3. **A** Development costs for software intended for *external sale* may be capitalized once the software is considered technically feasible. Development costs for software intended for *use within the business* may be capitalized once it is probable that the software will be completed and used as intended. Capitalization stores costs in the balance sheet rather than recognizing them in the income statement at the time it is incurred, resulting in higher earnings in the year of capitalization. Future earnings will be lower if costs are capitalized, as the intangible asset is amortized over the period it generates benefits. (LOS 33.a)

Module Quiz 33.2

1. **A** An asset is impaired when the firm cannot recover the carrying value. Under U.S. GAAP, recoverability is tested based on undiscounted future cash flows. (LOS 33.b)

2. **C** The carrying value of the asset is equal to $250,000 – $150,000 = $100,000. Under U.S. GAAP, a two-step process is used. The recoverability test is used to identify if an impairment has occurred. An impairment has occurred if the carrying value is higher than the estimated undiscounted cash flows from the asset's use and disposal. In this case, $105,000 is greater than the $100,000 carrying value, so the asset is not impaired under U.S. GAAP. Under IFRS, carrying value is compared to the recoverable amount. The recoverable amount is the higher of fair value less selling costs and value in use. In this case, value in use would be used as $90,000 is greater than $85,000. IFRS would record an impairment of $10,000, equal to carrying value less value in use. (LOS 33.b)

3. **B** Because a finite-lived identifiable intangible asset would be amortized, amortization expense in the year after the reduction from the impairment charge would be lower (the carrying value of the asset would most likely be lower), increasing net income. (LOS 33.b)

4. **A** Gain or loss is equal to the sale proceeds minus the carrying value (cost minus accumulated depreciation) at the time of sale. Given the loss of $15,000 and carrying value of $40,000 ($100,000 – $60,000), we can solve for the proceeds of $25,000 (−15,000 + 40,000). (LOS 33.b)

5. **C** An upward revaluation will increase the book value of assets and increase depreciation expense in future periods (decreasing net income), both of which reduce ROA. Impairment would have the opposite effects, reducing the carrying value of assets and decreasing future depreciation. Derecognizing an asset may increase, decrease, or not affect ROA in future periods. (LOS 33.b)

6. **C** The gain or loss on an asset's exchange is calculated as the difference between the fair value of the asset that has been disposed of and the carrying value of the disposed asset. The new asset should be recorded in the balance sheet at the fair

value of the asset disposed of. If the fair value of the disposed asset is difficult to estimate, then the gain or loss on disposal is computed as the fair value of the asset acquired in the exchange less the carrying value of the asset disposed of. The new asset would be recorded at its fair value in the balance sheet. If neither the fair value of the asset disposed of nor acquired can be established, the new asset will be recorded at the carrying value of the disposed asset. In this situation, there will be no gain or loss recorded on disposal. (LOS 33.b)

Module Quiz 33.3

1. **C** The average age is not a required disclosure. However, it can be calculated given other disclosures. (LOS 33.c)
2. **B** The remaining useful life can be estimated as ending net PP&E value divided by annual depreciation, so (300 − 80) / 15 = 14.66 years. (LOS 33.c)
3. **C** The average age can be estimated as ending accumulated depreciation value divided by annual depreciation, so 200 / 90 = 2.22 years. (LOS 33.c)
4. **A** U.S. GAAP requires the disclosure of impairment losses, but not reversals. U.S. GAAP typically does not allow the reversal of impairments, with the exception of assets held for sale. (LOS 33.c)

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[1] Definition per U.S. GAAP, ASC 505-60.

READING 34

TOPICS IN LONG-TERM LIABILITIES AND EQUITY

MODULE 34.1: LEASES

Video covering this content is available online.

LOS 34.a: Explain the financial reporting of leases from the perspectives of lessors and lessees.

Instead of purchasing an asset, a firm may choose to lease the asset. With a lease, a firm (the **lessee**) essentially purchases the right to use an asset from another firm (the **lessor**) for a specified period, which can range from a month to many years. The lessee makes periodic payments to the lessor for the use of the asset. Thus, a lease can be considered an alternative to financing the purchase of an asset.

To be a lease, a contract must meet the following three requirements:

1. It must refer to a specific asset.
2. It must give the lessee effectively all the asset's economic benefits during the term of the lease.
3. It must give the lessee the right to determine how to use the asset during the term of the lease.

The advantages of leasing rather than purchasing an asset may include the following:

- *Less initial cash outflow*. Typically, a lease requires only a small down payment, if any.
- *Less costly financing*. Because a lease is effectively secured by the leased asset if the lessee defaults, the interest rate implicit in a lease contract may be less than the interest rate would be on a loan to purchase the asset.
- *Less risk of obsolescence*. At the end of a lease, the lessee often returns the leased asset to the lessor, and therefore, does not bear the risk of an unexpected decline in the asset's end-of-lease value. Given that the lessor bears the risk of obsolescence, this increases the lessor's risk and is reflected in a higher implicit interest rate within the lease. Some leases include guaranteed residual income clauses, whereby the lessee guarantees a minimum value for the leased assets at the end of the lease term. In this case, the risk of obsolescence remains with the lessee.

Under IFRS and U.S. GAAP, any lease in which both the benefits and the risks of ownership are substantially transferred to the lessee is classified as a **finance lease**. If

either the benefits or the risks of ownership are not substantially transferred to the lessee, a lease is classified as an **operating lease**. Any given lease will be classified the same way by the lessee and the lessor.

Financial reporting standards require a lease to be classified as a finance lease if it meets *any* of the following five conditions:

1. Ownership of the leased asset transfers to the lessee.
2. The lessee has an option to buy the asset and is expected to exercise it.
3. The lease is for most of the asset's useful life.
4. The present value of the lease payments is greater than or equal to the asset's fair value.
5. The lessor has no other use for the asset (i.e., the asset is of a specialized nature only suitable for use by the lessee).

Leases that are not classified as finance leases are classified as operating leases.

Lessee Accounting

IFRS requires the lessee to record a **right-of-use asset (ROU asset)** and a **lease liability** (both equal to the present value of the lease payments) on the balance sheet. This treatment is required for all leases, except those that are short term (up to 12 months) or are of low value (up to USD 5,000). This treatment creates a debt instrument (the lease liability) and an ROU asset, resulting in a balance sheet that is comparable to the lessee issuing debt and using the proceeds to buy an asset.

The ROU asset is intangible rather than PP&E. The ROU asset will be amortized over the term of the lease, with the amortization amount each period recorded on the income statement. Each lease payment is split between interest and principal repayment. The lease liability decreases each period by the principal portion of each lease payment. While the lease asset and the liability both begin with the same value and reach zero at the end of the lease, they will have different values during the life of the lease, as the following example illustrates.

PROFESSOR'S NOTE

All the examples in the Level I CFA curriculum assume that payments are made in arrears (the end of each period) rather than at the start. In practice, most leases require payment at the start of each period. We follow the curriculum in our examples.

EXAMPLE: Lessee accounting for a finance lease

The Affordable Company (Affordable) leases a machine for its own use for four years with annual payments of $10,000. At the end of the lease, which is also the end of the machine's useful life, Affordable will return the machine to the lessor. The interest rate implicit in the lease is 5%. Assuming that the ROU asset is amortized on a straight-line basis over the term of the lease, calculate the impact of the lease on Affordable's financial statements for each of the four years.

Answer:

The lease is classified as a finance lease because the lease is in effect for the asset's useful life.

The present value of the lease payments is as follows:

$$N = 4; I/Y = 5; PMT = -10{,}000; FV = 0; CPT \rightarrow PV = 35{,}460$$

This amount will be recognized on the balance sheet as an ROU asset and as a lease liability.

The ROU asset will be amortized straight-line over the four years, decreasing each year by $35,460 / 4 = $8,865. This amount will be recognized each year on the income statement as an amortization expense.

The lease liability will be treated as if it were an amortizing loan.

Year	(1) Beginning Liability $	(2) Interest Expense = (1) × 5% $	(3) Lease Payment $	(4) Principal Repayment = (3) − (2) $	Ending Lease Liability = (1) − (4) $	Book Value of ROU Asset $
0					35,460	35,460
1	35,460	1,773	10,000	8,227	27,233	26,595
2	27,233	1,362	10,000	8,638	18,595	17,730
3	18,595	930	10,000	9,070	9,525	8,865
4	9,525	475	10,000	9,525	0	0

The interest expense will be recognized each year on the income statement, separately from the amortization expense for the ROU asset. On the balance sheet, the ROU asset value decreases by $8,865 each year, and the lease liability is reduced by the principal repayment from Column 4. Note that the book value of the ROU asset is less than the book value of the lease liability during the life of the lease. This is because the principal repayment in the early years of the lease is less than the straight-line amortization of the ROU asset. In the later years, the principal repayment is greater than the straight-line amortization so that at the end of the lease, both the asset and the liability reach zero.

On the cash flow statement, the repayment of principal will be classified as a cash outflow from financing. Under IFRS, the interest portion of each payment may be classified as either an operating or a financing cash outflow. Under U.S. GAAP, the interest portion is classified as an operating cash outflow.

Under U.S. GAAP, other than these differences in cash flow classification, a finance lease (that is not short term) is reported, just as we have described for leases under IFRS.

For an *operating lease* (that is not short term) under U.S. GAAP, a lease liability is also recorded and amortized as under IFRS. However, the ROU asset is not amortized straight-line. Instead, it is amortized by the same amount each period as the decrease in

the lease liability, so that the asset and the liability are equal in each period of the lease. On the income statement, interest expense and amortization of the ROU asset are not reported separately as they are for a finance lease; they are combined and reported as lease expense. On the cash flow statement, the full lease payment is classified as an operating cash outflow.

EXAMPLE: Lessee accounting for an operating lease under U.S. GAAP

Using the same data from the previous example, calculate the impact of the lease on Affordable's financial statements if Affordable reports under U.S. GAAP and the lease is classified as an operating lease.

Answer:

The lease liability will be treated the same way as it is for a finance lease, but the book value of the ROU asset will remain equal to the book value of the lease liability.

	(1) Beginning Liability	(2) Interest = (1) × 5%	(3) Lease Payment	(4) Principal Repayment = (3) − (2)	Ending Lease Liability = (1) − (4)	Book Value of ROU Asset
Year	$	$	$	$	$	$
0					35,460	35,460
1	35,460	1,773	10,000	8,227	27,233	27,233
2	27,233	1,362	10,000	8,638	18,595	18,595
3	18,595	930	10,000	9,070	9,525	9,525
4	9,525	475	10,000	9,525	0	0

On the balance sheet, the book value of the ROU asset is amortized by the same amount each period, as the lease liability (i.e., the amortization of the asset) is equal to the principal repayment.

On the income statement, the lease expense will equal interest plus amortization of the ROU asset, which will equal the lease payment. Amortization is equal to the principal repayment each period, and the principal repayment equals the lease payment minus interest. As a result, amortization plus interest each period is equal to the lease payment of $10,000.

On the cash flow statement, the entire $10,000 cash outflow is classified as cash from operations.

Comparison of finance and operating leases: U.S. GAAP

Balance Sheet

Year	ROU Asset		Lease Liability	
	Finance Lease	Operating Lease	Finance Lease	Operating Lease
	$	$	$	$
0	35,460	35,460	35,460	35,460
1	26,595	27,333	27,233	27,233
2	17,730	18,595	18,595	18,595
3	8,865	9,525	9,525	9,525
4	0	0	0	0

Income Statement

Year	Finance Lease			Lease Expense, Operating Lease
	Interest	Amortization	Total	
	$	$	$	$
0				
1	1,773	8,865	10,638	10,000
2	1,362	8,865	10,227	10,000
3	930	8,865	9,795	10,000
4	475	8,865	9,340	10,000

Note the following when comparing finance lease accounting and operating lease accounting:

- The lease liability is the same each year under both methods. The ROU asset is not the same, except at initiation of the lease and at the end of the lease. Operating leases report higher ROU assets.
- The ROU asset matches the lease liability in each year for the operating lease. The ROU asset only matches the lease liability at the start and end of the lease's life for the finance lease.
- Finance lease methodology reports both interest and amortization expenses in the income statement. Operating lease methodology reports a lease expense equal to the payment, which is not split into interest and amortization components.
- In the early years of a lease's life, the income statement expense is greater in total for a finance lease compared to an operating lease. In the later years, income statement expense is less for a finance lease. In total, the same amount of expense goes through the income statement under both methodologies.
- Both operating and finance leases should be treated as financial liabilities and included in leverage measures.

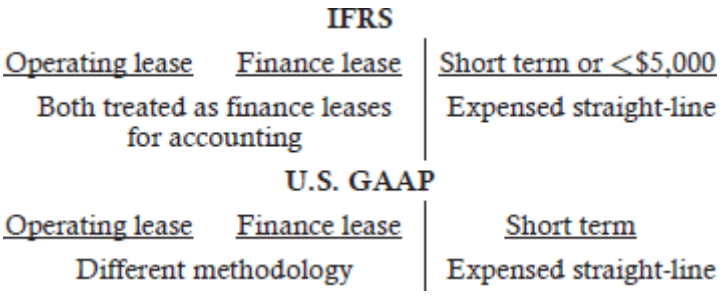
The impact on the financial statements is summarized in Figure 34.1.

Figure 34.1: Impact on Financial Statements

	Finance Lease (IFRS and U.S. GAAP)	Operating Lease (U.S. GAAP)
Balance sheet assets (ROU asset)	Lower	Higher
Balance sheet liabilities	Same	Same
Income statement earnings (early years)	Lower	Higher
Income statement earnings (later years)	Higher	Lower
EBIT	Higher	Lower
Interest expense	Higher	Lower
Operating cash flows (CFO)	Higher	Lower
Financing cash flows (CFF)	Lower	Higher

For short-term (<12 months) or low-value leases under IFRS, and for short-term leases under U.S. GAAP, no lease asset or liability is reported on the balance sheet. Each period, the lease payment is reported as rental expense on the income statement, spread straight-line over the life of the lease. A summary of the approaches is shown in Figure 34.2.

Figure 34.2: Lessee Accounting



Lessor Accounting

Under both IFRS and U.S. GAAP, there are two lease classifications for lessors, finance leases and operating leases, just as for lessees. At the initiation of a finance lease, the lessor removes the leased asset from its balance sheet and adds a **lease receivable** asset, equal to the value of the expected lease payments. If this value is different from the asset's book value, the lessor will recognize a profit or a loss. Over the term of the lease, the lessor will use the effective interest method (the same method we have just seen for lessees) to amortize the lease receivable and will report the interest portion of the lease payments as income. This interest income is included in the lessor's revenue for the period if the firm is a manufacturer or dealer of the leased asset. On the cash flow statement, the entire cash inflow is classified as cash from operations.

If manufacturing or dealing in the leased equipment is the main business operation of the firm, the sales proceeds will be in the revenue line and the carrying value of the asset will be a cost of sale. In other words, the treatment is like selling inventory. Both IFRS and U.S. GAAP refer to this treatment as a **sales-type lease**.

If the lessor is a financing company, rather than a manufacturer of the leased equipment, a gain or loss is not recognized at initiation. Instead, the gain or loss is deferred, and it is recognized over the life of the lease as interest income (for a gain) or an expense (for a loss). IFRS and U.S. GAAP refer to these leases as **direct financing leases**.

EXAMPLE: Lessor accounting for a finance lease

The Expensive Company is the lessor to Affordable Company from our lessee accounting example. Expensive is a manufacturer of the equipment being leased.

From the previous lessee examples, the lease had annual payments of $10,000 over a four-year period. At the end of the lease, which is also the end of the machine's useful life, Affordable will return the machine to the lessor. The interest rate implicit in the lease is 5%. Expensive believes the asset will have a residual value of $2,000 at the end of the lease period. The carrying value of the asset, recorded as inventory in the lessor's balance sheet, was $30,000.

Calculate the impact of the lease on Expensive's financial statements for each of the four years if the lease is treated as a finance lease.

Answer:

Profit or loss on derecognition of asset:

The present value of the lease payments is computed at the 5% rate implicit in the lease. In our example, the PV of lease payments = $35,460 (the same as in the lessee example). This is treated as revenue at the beginning of the lease.

$$\text{The present value of the expected residual value} = \frac{\$2{,}000}{(1.05)^4} = \$1{,}645.$$

The cost of sales is equal to the asset's carrying value less the present value of the residual value: $30,000 – $1,645 = $28,355.

	$
Revenue = present value of lease payments	35,460
Cost of sale = carrying value – present value of residual value	(28,355)
Gross profit or (loss)	7,105

Balance sheet lease receivable asset and interest income:

The sum of the present value of lease payments and the salvage value is referred to the **net investment in the lease** and will be the initial value of the lease receivable asset in the balance sheet.

$$\text{net investment in the lease} = \$35{,}460 + \$1{,}645 = \$37{,}105$$

The net investment in the lease is equal to the asset's fair value. This is because the interest rate implicit in the lease is the internal rate of return that makes the present

value of the lease payments received and the residual value equal the asset's fair value.

Year	(1) Beginning Lease Receivable Asset (Net Investment in the Lease)	(2) Interest Income = (1) × 5%	(3) Lease Payment Received	(4) Principal Repayment = (3) − (2)	Ending Lease Receivable Asset = (1) − (4)
	$	$	$	$	$
0					37,105
1	37,105	1,855	10,000	8,145	28,960
2	28,960	1,448	10,000	8,552	20,408
3	20,408	1,020	10,000	8,980	11,428
4	11,428	572	10,000	9,428	2,000

At the end of the lease period, the lease receivable asset is equal to the expected residual value of the asset. If the lessor disposes of the asset for any amount that differs from the residual value, a further gain or loss will be reported in the income statement.

For an operating lease, the lessor does not remove the leased asset from its balance sheet. The lessor will continue to record the depreciation expense over the life of the asset. On the income statement, the lessor reports the lease payments as income, while depreciation and other costs associated with leasing the asset are reported as expenses. As with a finance lease, the entire cash inflow is classified as cash from operations.

EXAMPLE: Lessor accounting for an operating lease

Using the same data, calculate the impact on Expensive's financial statements for each of the four years if the lease is treated as an operating lease. Assume straight-line depreciation with a salvage value of $2,000.

Answer:

The asset remains in the lessor's balance sheet, typically within plant, property, and equipment. The asset will continue to be depreciated over the life of the lease. No lease receivable asset is created. Payments from the lessee are treated as rental income (lease revenue) on a straight-line basis in the income statement.

$$\text{depreciation expense} = \frac{(\$30{,}000 - \$2{,}000)}{4 \text{ years}} = \$7{,}000$$

Year	Net Plant, Property, and Equipment	Depreciation Expense	Lease Revenue	Net Income Statement Impact
	$	$	$	$
0	30,000			
1	23,000	7,000	10,000	3,000
2	16,000	7,000	10,000	3,000
3	9,000	7,000	10,000	3,000
4	2,000	7,000	10,000	3,000

Comparing the financial statements for lessors using the finance lease and operating lease approaches shows that the choices have a dramatic impact, with the exception of the cash flow statement.

Lessor: Finance vs. Operating Lease Comparison

Year	Balance Sheet		Income Statement		Cash Flow Statement	
	Finance Lease	Operating Lease	Finance Lease	Operating Lease	Finance Lease	Operating Lease
	Lease Receivable	Net PP&E	Interest Revenue	Net of Lease Revenue and Depreciation	CFO	CFO
	$	$	$	$	$	$
0	37,105	30,000				
1	28,960	23,000	8,960*	3,000	10,000	10,000
2	20,408	16,000	1,448	3,000	10,000	10,000
3	11,428	9,000	1,020	3,000	10,000	10,000
4	2,000	2,000	572	3,000	10,000	10,000
Total			12,000	12,000	40,000	40,000

*Year 1 contains the profit on the derecognition of the asset and Year 1 interest revenue ($7,105 + $1,855).

Note that the same total income hits the income statement under both treatments, but the amounts in each individual year vary.

MODULE QUIZ 34.1

1. Compared to purchasing a long-lived asset using debt financing, leasing the asset *most likely*:

   A. is more costly to the lessee.
   B. requires a greater initial cash outflow from the lessee.
   C. allows the lessee to avoid the risk of obsolescence.

2. Under IFRS, which of the following lease types *least likely* requires a lessee to create a right-of-use (ROU) asset and a lease liability?

   A. Low-value leases.
   B. Operating leases.

C. Finance leases.

3. During the life of a long-term lease under IFRS, the lessee recognizes:
   A. interest expense only.
   B. amortization expense and interest expense.
   C. neither amortization expense nor interest expense.
4. Criteria for reporting a lease as a finance lease *least likely* include that the:
   A. present value of the lease payments is less than the fair value of the asset.
   B. lease term is for substantially most of the asset's useful life.
   C. lessee directs the use of the asset and retains the benefits from the asset's use.
5. For a lessor, operating leases result in:
   A. interest income recorded in the income statement.
   B. a profit or loss at the beginning of the lease.
   C. depreciation on the leased asset.
6. For a lessee with an operating lease, which of the following is *most accurate*?
   A. Both IFRS and U.S. GAAP report interest and amortization in the income statement.
   B. For both IFRS and U.S. GAAP, the right-of-use (ROU) asset will equal the lease liability over the life of the lease.
   C. IFRS will typically result in a lower ROU asset than U.S. GAAP.
7. For a lessor, cash flows from a lease are classified as:
   A. operating.
   B. investing.
   C. financing.
8. If the lessor in a finance lease is a manufacturer or dealer of leased equipment, the lessor will:
   A. retain the asset in its balance sheet and continue to depreciate it.
   B. record higher revenues at lease inception when compared to an operating lease.
   C. record lease revenue in its income statement rather than interest and amortization.

MODULE 34.2: DEFERRED COMPENSATION AND DISCLOSURES

Video covering this content is available online.

LOS 34.b: Explain the financial reporting of defined contribution, defined benefit, and stock-based compensation plans.

Pension plans and stock-based awards are examples of **deferred compensation**, where employees earn compensation in the current period but do not receive cash flows until later. Typically, the accounting for deferred compensation requires judgment and assumptions by management.

Pension Plans

A **pension** is a form of deferred compensation earned over time through employee service. The most common pension arrangements are defined contribution plans and defined benefit plans.

A **defined contribution plan** is a retirement plan in which the firm contributes a sum each period to the employee's retirement account. The firm's contribution can be based on any number of factors, including years of service, the employee's age, compensation, profitability, or even a percentage of the employee's contribution. In any event, the firm makes no promise to the employee regarding the future value of the plan assets. The investment decisions are left to the employee, who assumes all of the investment risk.

The financial reporting requirements for defined contribution plans are straightforward. The pension expense is simply equal to the employer's contribution. Once the contribution is paid, there is no future obligation to report on the balance sheet as a liability.

In a **defined benefit plan**, the firm promises to make periodic payments to employees after retirement. The benefit is usually based on the employee's years of service and the employee's compensation at, or near, retirement. For example, an employee might earn a retirement benefit of 2% of her final salary for each year of service. Consequently, an employee with 20 years of service and a final salary of $100,000 would receive $40,000 ($100,000 final salary × 2% × 20 years of service) each year upon retirement until death. Because the employee's future benefit is defined, the employer assumes the investment risk.

A company that offers defined pension benefits typically funds the plan by contributing assets to a separate legal entity, usually a trust. The plan assets are managed to generate the income and principal growth necessary to pay the pension benefits as they come due. The fair value of plan assets is just the current value of the pool of assets at today's date.

Financial reporting for a defined benefit plan is much more complicated than for a defined contribution plan because the employer must estimate the value of the future obligation to its employees. The obligation involves forecasting numerous variables, such as future compensation levels, employee turnover, average retirement age, mortality rates, and an appropriate discount rate. Due to the complexity, firms employ the services of external actuaries to estimate the values. The liability side of the pension plan is the present value of the expected payments to the employees from retirement to death discounted back to today's date.

For a defined benefit plan, the **net pension asset** or **net pension liability**, referred to as **funded status**, is a key element for analysis. If the fair value of the plan's assets is greater than the estimated pension obligation, the plan is said to be *overfunded*, and the sponsoring firm records a net pension asset on its balance sheet. If the fair value of the plan's assets is less than the estimated pension obligation, the plan is *underfunded*, and the firm records a net pension liability.

For plans relating to post-retirement health care benefits, the liability represents the present value of expected health care premiums post retirement. These plans are typically not prefunded with a pool of assets; therefore, they will always be a liability on the balance sheet.

The change in the net pension asset or liability is recognized on the firm's financial statements each year. Some components are included in net income, while others are

recorded as changes to other comprehensive income (OCI). The total economic cost of running the plan is the same under U.S. GAAP and IFRS; however, the split between the income statement and OCI differs.

PROFESSOR'S NOTE
Accounting for defined benefit pension plans is addressed in more detail at Level II.

Accounting for Defined Benefit Plans Under IFRS

The change in funded status comprises three elements:

1. **Service cost.** This represents the present value of the additional benefits employees are entitled to after retirement because they have worked an additional year. This element also includes "past service costs," which represent changes to the benefits earned in previous periods resulting from alterations to the plan and other factors.
2. **Net interest expense or income.** This is calculated as the net pension asset or liability times the plan's discount rate. If the plan's beginning funded status is a net asset, the company will report interest income; if the plan is underfunded at the start of the year, the company will report interest expense.

PROFESSOR'S NOTE
Due to the interest element, analysts should treat a balance sheet liability as a debt instrument for leverage computations.

3. **Remeasurements.** There are two sources of remeasurement: actuarial gains and losses, and the difference between actual and expected returns on plan assets. Actuarial gains and losses are changes in the net pension asset or liability that result from changing actuarial estimates, such as the rate of salary growth, discount rate, employee turnover, retirement age, and mortality rates. The difference between expected and actual return on plan assets results from the expected return being included in the income statement and the actual return being a component of funded status in the balance sheet.

The income statement expense under IFRS only includes service costs and net interest expense or income. Remeasurement gains and losses are taken directly to other comprehensive income within stockholders' equity.

Accounting for Defined Benefit Plans Under U.S. GAAP

The change in a net pension asset or liability has five components under U.S. GAAP. The first three are recognized in the income statement each period, while the last two go to other comprehensive income.

1. Service costs for the current period.
2. Interest expense or income.
3. The expected return on plan assets.
4. Past service costs.

5. Actuarial gains and losses.

One of the differences from IFRS pension accounting is that past service costs are recognized in other comprehensive income, rather than in the income statement as part of employee service costs. These costs are amortized over the employees' service period. Actuarial gains and losses are typically treated the same way, but U.S. GAAP allows firms to recognize them in the period incurred.

For manufacturing companies, pension expense is allocated to inventory and cost of goods sold for employees who provide direct labor to production and to salary or administrative expenses for other employees. As a result, pension expense does not appear separately on the income statement for manufacturing companies. An analyst must examine the financial statement notes to find the details of these companies' pension expense.

Share-Based Compensation

Share-based compensation is designed to align the interest of managers and stockholders and reduce agency costs (which we described in the Corporate Issuers topic area). Share-based compensation does not require cash outflows from the company, but issuing employees stock will dilute the proportional ownership of existing shareholders and reduce earnings per share.

A criticism of share-based compensation is that an individual employee is unlikely able to directly influence the company's stock price—which, to a certain extent, is driven by the ebbs and flows of the markets. There is also a danger that stock award may make managers too risk-averse, to prevent declines in the value of their holdings. Stock options, on the other hand, may cause managers to take on too much risk, because options have asymmetrical payoffs. An option has value if the stock price is above the exercise price, but its value cannot fall below zero if the stock price is below the exercise price.

IFRS and U.S. GAAP both require the company to estimate the **fair value** of any stock-based compensation at the **grant date**, and to expense it to the income statement over the **vesting period**. The vesting period (service period) is the time between the grant date and when the employee receives the stock or can first exercise a stock option.

1. **Stock grants.** These are shares awarded outright, with restrictions, or contingent on performance. The fair value of the stock grant is the share price on the grant date. If vesting is not immediate, the compensation expense will be recognized between the grant date and the vesting date, which is known at the service period. If vesting is immediate, then the full fair value is recognized as an expense in the income statement on the grant date.
2. **Performance shares.** These are stock grants that depend on meeting a set performance target. Typically, the performance targets are not share price related, but instead focus on metrics like return on equity. While this addresses the concern that the individual may have little influence over share price, it may create incentives for managers to manipulate financial statements.

Stock grants that do not vest until certain criteria are met (typically, length of service or performance goals) are often referred to as **restricted stock units**.

Employee stock options are options to invest in the company's stock at a given price (the exercise price) at a future date. Unlike stock grants, which have value as long as the stock price is greater than zero, an option only has value if the stock price is above the exercise price. If an employee stock option is exercised, the company issues new shares in return for the exercise price. Option valuation models, such as the Black-Scholes-Merton or binomial models, are needed to compute the fair value of the option on the grant date. Some of the inputs that the models require are highly subjective—in particular, the assumed volatility of the company's stock price over the life of the option. The fair value is then expensed between the grant date and the vesting date (the date the option can first be exercised).

Stock grants have the following effects on financial statements:

1. The grant date is when the fair value is established. Fair value is normally the market price on this date.
2. If vesting is immediate, the full fair value is expensed to the income statement, and both common stock and additional paid-in capital (APIC) are increased by this amount.
3. If there is a length of time between the grant date and the vesting period (service period), a compensation expense is recognized in each year over the service period in the income statement on a straight-line basis. This appears in equity in an account such as a *share-based compensation reserve* or APIC. Over the entire service period, the total amount of the fair value of the option on the grant date will have been expensed to the income statement.
4. At the end of the service period, any amount remaining in an equity reserve will be recycled into common stock and APIC.

Stock options have the following effects on financial statements:

1. The fair value of the option is established using the option valuation methodology adopted.
2. As with grants, at the grant date, there is no impact on common stock or APIC, and the fair value is spread, straight-line, over the service period as a compensation expense in the income statement and an increase in APIC or a shared-based compensation reserve (IFRS 2 does not specify a required equity account).
3. For both grants and options, the expense in the income statement reduces retained earnings; however, stockholders' equity remains constant by increasing equity by the same amount.
4. On exercise of the option, cash increases by the exercise price received. Stockholders' equity increases by the same amount, split between common stock at par and APIC, with any amount in an equity reserve also being recycled into APIC.

Stock-based appreciation rights (SARs) generate cash for the holders that is linked to stock performance. The employee receives payments based on the change in value of the company's shares without needing to hold the stock. These have the advantage of aligning employees' and shareholders' interest without creating new shares and diluting existing shareholders. They have payoffs similar to stock options, and so do not introduce bias toward risk-averse behavior. The downside for the company is that they

result in cash outflows when the stock performs well. Non-exchange-traded firms may use a version of this called **phantom stock**, where the cash payments are related to the performance of a hypothetical stock.

LOS 34.c: Describe the financial statement presentation of and disclosures relating to long-term liabilities and share-based compensation.

Lease Disclosures

The objective of lease disclosures is to provide users of financial statements with a basis to assess the effect of leasing activities on the entity's financial position, performance, and cash flows. To achieve that objective, lessees and lessors disclose both qualitative and quantitative information.

As indicated in IFRS 16, here is what lessee disclosures must include:

- The carrying amount included in the balance sheet for the ROU asset by class of underlying asset
- Total cash outflows relating to the lease
- The interest expense included in the income statement resulting from the lease liability
- Depreciation (amortization) expensed in the period on the ROU asset, by class of underlying asset
- Expenses relating to variable lease payments not included in lease liabilities

PROFESSOR'S NOTE
Variable lease payments are included in the disclosure for lessees and lessors, but they are not defined by the Level I curriculum. There are two types of variable lease payments. The first is where the rental payments are linked to an index or rate (e.g., a market reference interest rate or the rate of inflation). The current lease liability and ROU asset are based on the current value of the index or rate and then are remeasured when there are changes. The second type relates to variable payments depending on future sales or use of the asset. These items are not included in the lease liability or ROU asset, and instead are expensed when occurred.

- Additions to ROU assets
- Maturity analysis of lease liabilities and the split between current and long-term liabilities

PROFESSOR'S NOTE
Next year's principal repayment will be a current liability, and the remaining principal repayments will be reported in long-term liabilities.

- Income statement expenses relating to low-value and short-term leases
- Quantitative and qualitative information on the following:
  - The nature of the leasing activities

  - Future cash outflows to which the lessee is exposed to that are not reflected in the lease liability (could include any guarantees of the leased asset's residual value)
  - Restrictions and covenants imposed by the lease
  - Sale and leaseback transactions (where the lessee sells the asset to the lessor and then immediately leases it back)

As indicated in IFRS 16, lessors must disclose the following for finance leases:

- Selling profit or loss on derecognition of the asset
- Finance income (interest) recognized in the income statement relating to the net investment in the lease (lease receivable asset)
- Income relating to variable lease payments not included in the measurement of the net investment in the lease
- Qualitative and quantitative explanation of significant changes in the net investment in the lease
- Maturity analysis of lease payments receivable
- Reconciliation of undiscounted lease payments to the net investment in the lease

As indicated in IFRS 16, lessors must disclose the following for operating leases:

- Lease income recognized in the income statement, separately disclosing income for variable lease payments that do not depend on an index or rate
- Maturity analysis of lease payments receivable—at a minimum, must show undiscounted lease payments to be received in each of the next five years and aggregated amounts beyond five years.
- The underlying asset remains in the lessor's balance sheet and must comply with the disclosure for the following:
  - IAS 16 for leases of property, plant and equipment, disaggregated by class
  - IAS 36: Impairments

Pension Disclosures

For defined contribution plans, the only disclosure requirement of IAS 19 is separate disclosure of the employer's contribution expensed in the income statement.

For defined benefit plans, IAS 19 sets out the following objectives:

1. Explain the characteristics and risks of its defined benefit plan. Much of the risk in defined benefit plans relates to the funded status of the plan—and in particular, underfunded plans.
2. Identify amounts in the financial statements relating to defined benefit plans.
3. Describe how defined benefit plans affect amounts, timings, and uncertainties relating to future cash flows. (Note that the cash flows relating to defined benefit plans are the employers' contribution.)

While the firm has discretion regarding how to achieve these objectives, some minimum disclosures are required. Disclosure requirements are as follows:

- The nature of the plan, governance, regulatory framework, and risk exposures

- Reconciliations of beginning and ending values for funded status, the present value of the defined benefit obligation, and plan assets, showing components of the change (includes changes in the balance sheet net asset or liability that are taken to the income statement expense and to OCI)
- Sensitivity analysis showing how changes to key actuarial assumptions (discount rate, rate of salary growth, mortality rates, etc.) affect the present value of the defined benefit obligation
- Composition of plan assets by asset type
- Expected employer contributions for the next period and beyond
- The maturity profile of the defined benefit obligation

Share-Based Compensation Disclosures

The objective of these disclosures is to provide users of the accounts with sufficient information to understand the nature and extent of stock-based compensation arrangements, including their impacts on current and future cash flows. Firms must disclose:

- The nature of the plan and key details such as grant date, vesting date, and service period, as well as settlement characteristics of employee stock options (physical delivery or cash settlement)
- How the fair value at the grant date was determined
- The effect of share-based transactions on earnings and the financial position (i.e., impacts on the income statement and balance sheet)

MODULE QUIZ 34.2

1. A net pension asset or liability can be associated with:
   A. defined benefit pension plans only.
   B. defined contribution pension plans only.
   C. either defined benefit or defined contribution pension plans.
2. Which of the following is *most accurate* concerning defined benefit pension plans under both IFRS and U.S. GAAP?
   A. The income statement expense is the same.
   B. The amounts taken to other comprehensive income (OCI) are the same.
   C. The total periodic cost of the plan is the same.
3. Which of the following is *least likely* a criticism of employee stock options?
   A. The binary nature of option payoffs may encourage excessive risk taking.
   B. The fair value requires subjective estimates at the grant date.
   C. They result in cash outflows for the company on exercise.

KEY CONCEPTS

LOS 34.a

Advantages of leasing rather than purchasing an asset may include a smaller initial cash outflow, lower-cost financing, and less risk of obsolescence.

A lease transfers the benefits and risks of ownership of the asset to the lessee. A finance lease must meet at least one of the following criteria:

1. Ownership of the leased asset transfers to the lessee.
2. The lessee has an option to buy the asset and is expected to exercise it.
3. The lease is for most of the asset's useful life.
4. The present value of the lease payments is greater than or equal to the asset's fair value.
5. The lessor has no other use for the asset (i.e., the asset is of a specialized nature only suitable for use by the lessee).

If none are met, the lease is an operating lease.

Lessee Reporting

Under IFRS, for both finance and operating leases, except for short-term leases, a lessee reports a right-of-use (ROU) asset and a lease liability on its balance sheet, both equal to the present value of the promised lease payments. The interest portion of each lease payment is reported as an interest expense, while the principal repayment portion of each payment reduces the lease liability. For short-term or low-value leases, rent expense is reported on the income statement, and no balance sheet entries are required.

Under U.S. GAAP, reporting for a finance lease is the same as under IFRS. For an operating lease, the reporting is similar as under IFRS, except that the entire lease payment is recorded as a lease expense and the amortization of the ROU asset is equal to the principal repayment. For short-term leases, rent expense is reported on the income statement, and no balance sheet entries are required.

Lessor Accounting

A lease that is classified as finance or operating by the lessee is classified the same way by the lessor.

Under both IFRS and U.S. GAAP, with a finance lease, the lessor removes the leased asset from its balance sheet and adds a lease receivable asset. The lessor reports the interest portion of the lease payments as income. For an operating lease, the lessor keeps the leased asset on its balance sheet, reports lease payments as income, and reports depreciation and other costs as expenses.

For a lessor, finance leases can be sales-type leases or direct financing leases. For a dealer or manufacturer of the leased equipment, the sales-type treatment is used. A profit or loss is recorded on the leased asset, as if it was inventory sold at initiation of the lease. For a direct financing lease, any gain or loss on derecognition is deferred and recognized in the income statement over the life of the lease as interest.

LOS 34.b

Defined Benefit Pension Plan Reporting

A firm reports a net pension liability on its balance sheet if the fair value of a defined benefit plan's assets is less than the estimated pension obligation, or a net pension asset if the fair value of the plan's assets is greater than the estimated pension obligation. The

change in the net pension asset or liability is reflected in a firm's income statement, and as changes to accumulated other comprehensive income (OCI) each period.

IFRS refers to the estimated pension liability as the present value of defined benefit obligations (PVDBO), while U.S. GAAP uses the term projected benefit obligation (PBO). In practice, the PVDBO and the PBO are the same. Both are equal to the benefits earned to date, to be paid between retirement and death, discounted back to the balance sheet date. The computations are complex and require actuaries to estimate the assumptions and values.

Given consistent actuarial assumptions, the total periodic cost of the defined benefit plan is the same under IFRS and U.S. GAAP. The amounts taken in the income statement and OCI, however, differ.

Service cost is the present value of the additional benefits earned by employees for being a member of the plan for an additional service period. Both IFRS and U.S. GAAP include this in the income statement expense.

The interest cost is the increase in the PVDBO (PBO) due to the passage of time. IFRS nets the interest cost with the expected return on plan assets to show interest income or expense. U.S. GAAP shows these two components separately as they can be computed using different rates. Whether reported net or separately, they are a component of the income statement expense.

Changes to the estimated pension liability as a result of actuarial estimates changing and the difference between actual and expected return on plan assets are taken directly to OCI. IFRS refers to these amounts as remeasurements, while U.S. GAAP refers to them as actuarial gains and losses. U.S. GAAP may potentially amortize these amounts through future income statement expenses, while IFRS does not.

Past service costs are changes to the estimated pension liability as a result of benefits earned in prior periods changing if the plan is amended. IFRS expenses these amounts in the income statement in the year of change. U.S. GAAP takes these amounts to OCI and then amortizes them to the income statement over the remainder of the employees' service life.

Defined Contribution Pension Plan Reporting

A pension expense for a defined contribution pension plan is equal to the employer's contributions. There is no balance sheet asset or liability reported, providing the employer's contribution has been made by year-end.

Stock Grants and Options Reporting

Stock grants and stock options serve to reward employees and align employees and shareholders' interest to reduce agency cost. Advantages to the company include the lack of cash outflows. Disadvantages include the employees' relative lack of influence over the company's stock price and dilution of existing shareholders.

Stock grants can have immediate or delayed vesting. The fair value of a stock grant is established on the grant date and is equal to the stock's fair value. If vesting is immediate, the fair value is expensed to the income statement, and common stock and

additional paid-in capital (APIC) are adjusted in the balance sheet, as if the company was issuing shares. If there is a period between the grant and vesting, it is referred to as the service period. The fair value of the stock grant is spread straight-line as a compensation expense in the income statement and increases common stock and APIC in the balance sheet.

Stock options give the employee the right to buy shares in the future at the exercise price. A criticism of employee stock options is that the binary nature of payoffs can lead to excessive risk taking. The fair value of the option must be estimated using subjective assumptions. The fair value is then expensed straight-line to the income statement over the vesting period. The vesting period is from the grant date until the first date the options can be exercised. A compensation expense is recorded in the income statement, and APIC increased in the balance sheet. At the point the options are exercised in the future cash increases by the exercise price received, common stock increases by the par value of share issued and any balance is taken to APIC. If the options expire and are not exercised, no adjustments need to be made.

LOS 34.c

Both IFRS and U.S. GAAP set out the objectives of disclosure for leases, defined benefit pension plans, and stock-based compensation. The objective of the disclosure is to provide the users of the accounts with sufficient information to understand the nature, risks, and extent of leases and compensation plans, including their impacts on current and expected cash flows. While companies have discretion over the disclosure needed to achieve these objectives, the accounting standards provide guidance.

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 34.1

1. **C** Avoiding the risk of obsolescence is one of the advantages of leasing assets instead of purchasing them. At the end of a lease, the lessee often returns the leased asset to the lessor, and therefore does not bear the risk of an unexpected decline in the asset's end-of-lease value. The interest rate implicit in a lease contract may be less than the interest rate on a loan to purchase the asset. The terms of a lease may not require all the covenants typically included in loan agreements or bond indentures. (LOS 34.a)

2. **A** Both operating leases and finance leases report an ROU asset and a lease liability, and both are accounted for identically. Under U.S. GAAP, operating and financing leases also report both an ROU asset and lease liability; however, the accounting for the two types is slightly different. Exceptions exist for low-value assets and leases with durations of less than one year under IFRS (U.S. GAAP has no monetary value criteria). (LOS 34.a)

3. **B** At lease inception, the lessee records a right-of-use (ROU) asset and a lease liability, both equal to the present value of the lease payments. In each period over the life of the lease, the lessee recognizes interest expense for the interest

portion of the lease payments and amortization expense on the ROU asset. (LOS 34.a)

4. **A** IFRS and U.S. GAAP treat a lease as a finance lease (for both lessee and lessor) if any of the following criteria are met:

    1. Ownership of the leased asset transfers to the lessee.
    2. The lessee has an option to buy the asset and is expected to exercise it.
    3. The lease is for most of the asset's useful life.
    4. The present value of the lease payments is greater than or equal to the asset's fair value.
    5. The lessor has no other use for the asset (i.e., the asset is of a specialized nature only suitable for use by the lessee).

    (LOS 34.a)

5. **C** For a lessor, the asset remains in their balance sheet if treated as an operating lease, and is depreciated over its life. There is no derecognition of the asset, so there is no gain or loss at the outset of the lease. Payments from the lessee are treated as rental income. (LOS 34.a)

6. **C** U.S. GAAP reports an income statement expense that is equal to the lease payment. While conceptually, the amount contains both interest and amortization, they are not shown separately on the income statement. IFRS reports both interest and amortization in the income statement, and the aggregate of the two amounts will not equal the lease payment. Under U.S. GAAP, the ROU asset and the lease liability are equal at all points over the lease's life. Under IFRS, the only points where the ROU asset is the same as the lease liability are at initiation and the end of the lease. IFRS will result in a lower ROU asset than U.S. GAAP. Under IFRS, the ROU asset is amortized over the life of the asset (using either straight-line or accelerated methods). Under U.S. GAAP, the amortization is equal to the principal payment on the liability. Principal payments initially are lower due to the high interest cost, but as the lease ages and the liability decreases, the interest element of each payment will decrease and the principal element will increase. The result is that accumulated amortization under IFRS is greater than U.S. GAAP, resulting in a lower ROU asset. (LOS 34.a)

7. **A** Cash flows from a lease are operating cash inflows for the lessor. (LOS 34.a)

8. **B** Finance leases for a lessor may be classified as either sales-type leases or direct financing leases. If the lessor is a manufacturer or dealer of the leased equipment, the asset is treated as inventory sold at the outset of the lease. Revenue is reported as well as a cost of sales amount. The revenue is the present value of lease receipts. Cost of sales is the carrying value of the asset less the present value of any residual value. The lease is a direct financing lease if the lessor is a financing company (buying an asset on behalf of the lessee and leasing it out). Any gain or loss on derecognition of the asset does not affect the income statement on lease initiation. The gain or loss is deferred and recognized in the income

statement, as interest, over the life of the lease. For an operating lease, revenue is recognized when lease payments from the lessee fall due. (LOS 34.a)

Module Quiz 34.2

1. **A** Defined benefit pension plans can be overfunded and result in a net pension asset, or they can be underfunded and result in a net pension liability. Defined contribution plans do not result in balance sheet assets or liabilities because they are neither owned by the sponsoring firm nor obligations of the sponsoring firm. (LOS 34.b)

2. **C** The total cost of the defined benefit pension plan is identical for both IFRS and U.S. GAAP. IFRS and U.S. GAAP differ in the amounts recognized in the income statement and the amounts taken to OCI. (LOS 34.b)

3. **C** On exercise, the company receives the option's exercise price (a cash inflow to the company) and creates new shares. This dilutes existing stockholders' ownership proportions in the company. The fair value of the option at the grant date requires subjective estimation—in particular, the volatility of the company's stock price over the service period. By nature, options have binary payoffs, being either zero if the stock price is below the exercise price or positive if the stock price is above the exercise price. This may lead to excessive risk taking because the option holder gains if the stock price increases, but if the stock price decreases the option holder does not experience losses except in the sense that the options go unexercised. (LOS 34.b)

READING 35

ANALYSIS OF INCOME TAXES

INTRODUCTION

There is a lot of overlap between the prerequisite materials and this reading. The prerequisites go into greater detail about the computation of tax bases for assets and liabilities, which may help with your understanding of this reading. The prerequisites also contain a numerical example of the impact of the enacted tax rate changing on existing deferred tax assets and liabilities.

MODULE 35.1: DIFFERENCES BETWEEN ACCOUNTING PROFIT AND TAXABLE INCOME

Video covering this content is available online.

LOS 35.a: Contrast accounting profit, taxable income, taxes payable, and income tax expense and temporary versus permanent differences between accounting profit and taxable income.

Financial accounting standards (IFRS and U.S. GAAP) are often different than income tax laws and regulations. As a result, the amount of income tax expense recognized in the income statement may differ from the actual taxes owed to the taxing authorities.

Let's begin by defining the terms we will use to distinguish items on a company's tax return (the information it files with its country's tax authorities) from the comparable items on its financial statements.

Tax Return Terminology

- **Taxable income.** This is income subject to tax based on the tax return.
- **Taxes payable.** This is the tax liability caused by *taxable income*. This is also known as the current tax expense, but do not confuse this with *income tax expense* (see next).
- **Income tax paid.** This is the actual cash flow for income taxes, including payments or refunds from other years.
- **Tax loss carryforward.** This is a current or past loss that can be used to reduce taxable income (thus, taxes payable) in the future. It can result in a deferred tax asset.
- **Tax base.** This is the net amount of an asset or liability used for tax reporting purposes.

Financial Reporting Terminology

- **Accounting profit.** This is pretax financial income based on financial accounting standards (also known as *income before tax* and *earnings before tax*).
- **Income tax expense.** This is the expense recognized in the income statement that includes taxes payable and *changes* in deferred tax liabilities and assets.
- **Deferred tax liabilities.** These are balance sheet amounts that result from an excess of income tax expense over taxes payable that are expected to result in future cash outflows.
- **Deferred tax assets.** These are balance sheet amounts that result from an excess of taxes payable over income tax expense that are expected to be recovered from future operations. These can also result from tax loss carryforwards.
- **Valuation allowance.** This is the reduction of deferred tax assets based on the likelihood the assets will not be realized.
- **Carrying value.** This is the net balance sheet value of an asset or liability.
- **Permanent difference.** This is a difference between taxable income (tax return) and pretax income (income statement) that will not reverse in the future.
- **Temporary difference.** This is a difference between the tax base and the carrying value of an asset or liability that will result in either taxable amounts or deductible amounts in the future. Several examples of how temporary differences arise are presented later in this review.

Differences Between Tax and Financial Reporting

Differences between the treatment of an accounting item for tax reporting and for financial reporting can occur when the following occur:

- The timing of revenue and expense recognition in the income statement and the tax return differ
- Certain revenues and expenses are recognized in the income statement, but never on the tax return or vice versa
- Assets and/or liabilities have different carrying amounts and tax bases
- Gain or loss recognition in the income statement that differs from the tax return
- Tax losses from prior periods may offset future taxable income
- Financial statement adjustments may not affect tax return, or may be recognized in different periods

Differences between the balance sheet carrying value and the tax base of an asset may be permanent or temporary. Temporary timing differences result from the same total amounts passing through the income statement and tax returns over time, but with differences in each individual period. These temporary timing differences result in the creation of deferred tax assets and deferred tax liabilities, which we will discuss next. Permanent timing differences do not result in deferred tax assets or liabilities.

Deferred Tax Liabilities

A **deferred tax liability (DTL)** is created when the income tax expense (income statement) is greater than taxes payable (tax return) due to temporary differences. DTLs occur when

- revenues (or gains) are recognized in the income statement before they are included on the tax return due to temporary differences, and
- expenses (or losses) are tax deductible before they are recognized in the income statement.

DTLs are expected to reverse (i.e., they are caused by temporary differences) and result in future cash outflows when the taxes are paid. These may be referred to as "taxable temporary differences" because the firm will pay more tax when they reverse.

A DTL is most often created when an accelerated depreciation method is used on the tax return and straight-line depreciation is used on the income statement.

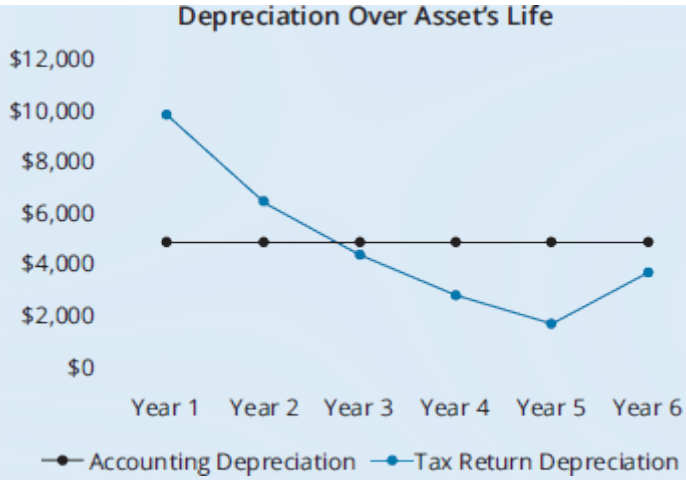
EXAMPLE: Temporary timing differences

Flippy Discs Corporation purchased an injection-molding machine for $30,000 at the start of the current period. The machine has a useful economic life of six years and no expected residual value. For accounting purposes, the machine will be depreciated straight line; however, a double declining balance will be used by the tax authorities. Calculate depreciation for accounting and for tax, and discuss the timing differences.

Answer:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Accounting depreciation	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$30,000
Tax return depreciation	$10,000	$6,667	$4,444	$2,963	$1,975	$3,951	$30,000

The total amount of depreciation over the life of the asset is the same. The accelerated method used in the tax returns results in more depreciation in the early years of the asset's life, but less in the later years relative to the straight-line method. This is a classic example of a taxable temporary difference.



Visually, we can see that the tax return depreciation is greater in the first two years, creating a timing difference, which then begins to reverse from Year 3.

Due to the temporary timing differences, taxable income will initially be lower than earnings before tax in the accounts. The result of this is that Flippy pays lower tax in Years 1 and 2. Once the tax return depreciation drops below the accounting depreciation, taxable income will be greater than earnings before tax, and Flippy will pay more tax. The temporary timing difference is created and then reverses, resulting in less tax due in the early years and more tax due in the later years. We know with certainty that when the timing difference reverses, Flippy will pay more tax, meeting the definition of a liability.

Deferred Tax Assets

A **deferred tax asset (DTA)** is created when taxes payable (tax return) are greater than income tax expense (income statement) due to temporary differences. DTAs occur when

- revenues (or gains) are taxable before they are recognized in the income statement,
- expenses (or losses) are recognized in the income statement before they are tax deductible, and
- tax loss carryforwards are available to reduce future taxable income.

Similar to DTLs, DTAs are expected to reverse through future operations. However, DTAs are expected to provide future tax savings, while DTLs are expected to result in future cash outflows. Timing differences that lead to the creation of DTAs may be referred to as "deductible temporary differences" because the creation or increase of a DTA will reduce the income statement tax expense. A firm that has taxable losses in excess of its taxable income can carry those excess losses forward and use them to reduce taxable income (and taxes) in future periods.

Post-employment benefits, unearned revenue, warranty expenses, and tax loss carryforwards are typical causes of DTAs.

Taxable and Deductible Temporary Differences

Initially, if taxable income (on the tax return) is lower than earnings before tax (on the income statement) because of a temporary timing difference, a DTL will be created. If taxable income is initially greater than earnings before tax, a DTA will be created.

Another way of analyzing temporary differences is to compare the balance sheet carrying values of assets and liabilities to their tax base values (Figure 35.1).

Figure 35.1: Comparison of Carrying Value to Tax Base for Temporary Timing Differences

Balance Sheet	Carrying Value vs. Tax Base	Deferred Tax Asset or Liability
Asset	Carrying value > tax base	Deferred tax liability
Asset	Carrying value < tax base	Deferred tax asset
Liability	Carrying value > tax base	Deferred tax asset
Liability	Carrying value < tax base	Deferred tax liability

PROFESSOR'S NOTE
The tax base of balance sheet assets and liabilities and the method of computation is covered in the FSA prerequisite readings.

Permanent Differences

A **permanent difference** between taxable income and pretax income is one that will not reverse in the future. Permanent differences do not create DTAs or DTLs. Permanent differences can be caused by revenue that is not taxable, expenses that are not deductible, or tax credits that result in a direct reduction of taxes. For example, in the United States, interest received on municipal bonds is typically not taxable (but appears on the financial statements as pretax income), and the cost of life insurance on key company officers is typically not tax deductible (but appears on the financial statements as a pretax expense).

Permanent differences cause the firm's effective tax rate to differ from the statutory tax rate. We will examine statutory, effective, and cash tax rates later in this reading.

Tax Expense

A company's tax expense is the amount included in the income statement and may be referred to as a tax provision. It includes the amount the company owes the tax authorities (tax payable) based on this year's taxable income, along with any changes in DTAs and DTLs:

$$\text{tax expense} = \text{tax payable} + \Delta\text{DTL} - \Delta\text{DTA}$$

Creation of, or increases in, DTLs increase tax expense. Creation of, or increases in, DTAs reduce tax expense. This is because DTAs are expected to provide future tax savings, while DTLs are expected to result in future cash outflows for tax. Because the firm's actions in the current period either caused deferred tax items to be created or

changed their values, the accruals concept requires the changes to be recognized in tax expense in the current period.

Changes in the Enacted Tax Rate

Changes in the company's statutory tax rate will also result in changes to DTLs and DTAs. Both DTLs and DTAs are created at the statutory tax rate in effect at the point of the initial timing difference. If the statutory tax rate changes, existing DTLs and DTAs must be adjusted. Because a DTL or DTA must reverse to zero when the timing differences reverse, they need to reflect the statutory tax rate expected to be in effect when reversal occurs. An increase in the statutory rate will increase both DTAs and DTLs, while a decrease will reduce them. Like any other change in a DTA or DTL, this will also affect tax expense in the income statement.

MODULE QUIZ 35.1

1. Which of the following tax definitions is *least accurate*?
   A. Taxable income is income based on the rules of the tax authorities.
   B. Taxes payable are the amount due to the government.
   C. Income tax expense equals pretax income times the statutory tax rate.
2. If the tax base of an asset is less than the carrying value of the asset and the difference is not expected to reverse in the future, this will result in:
   A. the creation of a DTL.
   B. the creation of a DTA.
   C. neither the creation of a DTA nor a DTL.
3. Which of the following is *least likely* to result in the creation of a deferred tax asset (DTA)?
   A. Expenses or losses that are tax deductible before they are recognized in the income statement.
   B. Revenues or gains that are taxable before they are recognized in the income statement.
   C. Tax loss carryforwards that are available to reduce future taxable income.
4. Sidewinder Corporation has a year-end accounts receivable carrying value of $500,000 after including a doubtful debt provision of 5% of year-end receivables. In the tax returns, bad debt is only deducted when it is written off. This treatment will *most likely* result in:
   A. the creation of a DTL.
   B. the creation of a DTA.
   C. neither the creation of a DTA nor a DTL.
5. Roadrunner, Inc., reported the following information in its tax returns and financial statements:

Tax return extract:	$
Tax payable for the year ended 20X7	500,000
Balance sheet extracts:	
DTA year-end 20X7	300,000
DTA year-end 20X6	350,000
DTL year-end 20X7	500,000
DTL year-end 20X6	400,000

Which of the following is *closest* to the tax expense reported in Roadrunner's 20X7 income statement?

A. $500,000.
B. $550,000.
C. $650,000.

6. An increase in the tax rate causes the balance sheet value of a DTA to:
   A. decrease.
   B. increase.
   C. remain unchanged.

MODULE 35.2: DEFERRED TAX ASSETS AND LIABILITIES

Video covering this content is available online.

LOS 35.b: Explain how deferred tax liabilities and assets are created and the factors that determine how a company's deferred tax liabilities and assets should be treated for the purposes of financial analysis.

Creation of DTAs and DTLs

As discussed, DTAs and DTLs result from temporary timing differences between earnings before tax and taxable income. For a timing difference to be temporary, the amount that passes through the income statement and the tax return over the life of the asset or liability must be the same, even though the amounts differ that pass through each during individual periods.

EXAMPLE: Deferred tax assets and liabilities

Firebird Corporation is a new subsidiary set up at the start of the year by its parent company, Wraith Incorporated. Firebird's statutory tax rate is 30%, and it has no permanent timing differences. Tax returns and income statements are presented for the first three years of its operation.

Tax return: Firebird Corporation

	Year 1 $000	Year 2 $000	Year 3 $000
Revenue	100,000	120,000	130,000
Cost of sales	28,500	34,200	37,050
Other expenses	19,950	23,940	25,935
Depreciation	10,000	10,000	10,000
Warranty costs	2,000	5,000	8,000
Interest expense	10,000	12,000	12,500
Taxable income	29,550	34,860	36,515
Tax payable 30%	8,865	10,458	10,955

Income statement: Firebird Corporation

	Year 1 $000	Year 2 $000	Year 3 $000
Revenue	95,000	114,000	123,500
Cost of sales	28,500	34,200	37,050
Gross profit	66,500	79,800	86,450
Other expenses	19,950	23,940	25,935
Depreciation	8,000	8,000	8,000
Interest expense	10,000	12,000	12,500
Earnings before tax	28,550	35,860	40,015
Tax expense	8,565	10,758	12,005
Net income	19,985	25,102	28,010

Firebird acquired PP&E for $40 million at the start of Year 1. For financial statement reporting, the PP&E is depreciated straight-line over five years, while for tax reporting, it is depreciated straight-line over four years. Its residual value is assumed to be zero in both cases.

Firebird estimates that warranty expense will be 5% of gross revenues. For this example, we will assume all of the year-end liability values for warranties are likely to pass through future tax returns as the expenditure is incurred.

Analyze the differences between the tax return and the income statement, and calculate any deferred tax items that Firebird will recognize.

Answer:

The first noticeable difference is the revenue figures. Remember that revenue is reported net of any returns and allowances in the income statement (e.g., items such as estimated warranty provisions and customer discounts). The tax return has a line for warranty costs, which indicates that these may be the source of some of the difference. Another significant difference between the two statements are the depreciation lines. Finally, the tax return shows tax payable on taxable income, which differs from the tax expense in the income statement. The latter includes tax payable and changes in DTAs and DTLs.

1. Timing differences related to depreciation

$$\text{tax allowable depreciation} = \frac{\$40{,}000{,}000 - \$0}{4 \text{ years}} = \$10{,}000{,}000$$

$$\text{accounting depreciation} = \frac{\$40{,}000{,}000 - \$0}{5 \text{ years}} = \$8{,}000{,}000$$

In total, $40 million of depreciation will pass through the tax returns and income statements, but different amounts will be reported for each individual year. Depreciation will be higher in the tax returns than in the income statement for each of the first four years. Firebird will recognize a DTL because the firm pays lower tax initially and higher tax on the reversal of the timing difference. We may also say the asset's carrying value is greater than its tax base, resulting in a DTL. After Year 4, depreciation in the tax return will be zero, while depreciation in the income statement will continue, causing the timing difference to reverse.

End of Period	Year 1	Year 2	Year 3	Year 4	Year 5
	$000	$000	$000	$000	$000
Carrying value	32,000	24,000	16,000	8,000	0
Tax base	30,000	20,000	10,000	0	0
Timing difference	2,000	4,000	6,000	8,000	0
DTL @ 30%	600	1,200	1,800	2,400	0
Δ DTL	+600	+600	+600	+600	−2,400

The timing difference grows over the first four years and then reverses in Year 5. Carrying value is equal to the asset's cost less accumulated accounting depreciation. The tax base can be viewed as cost less accumulated tax-allowable depreciation. (Formally, it is defined as the total depreciation that will pass through the tax returns in future periods.)

2. Timing differences related to warranties

A warranty is a commitment to replace or repair a good if it becomes defective during the stated warranty period. Due to the accruals process—and in particular, the matching concept—the cost of meeting future warranty claims must be estimated and accounted for at the time of the sale. The estimated future warranty expense is deducted from revenue, and a warranty liability is created in the balance sheet. Tax authorities, however, are unwilling to allow companies to save tax on *estimated* expenses. As a result, they typically require the expenditure to repair or replace faulty goods to have been incurred before they allow a deduction in the tax returns.

The following table shows the warranty provision, given Firebird's estimate of 5% of sales, and the expenditure actually incurred in each of the three years (from the tax return).

	Year 1	Year 2	Year 3
	$000	$000	$000
Warranty provision	5,000	6,000	6,500
Warranty expenditure	2,000	5,000	8,000

The balance sheet liability will increase by each year's warranty provision, offset by the actual expense incurred:

Carrying Value	Year 1	Year 2	Year 3
	$000	$000	$000
Warranty liability (at start of period)	0	3,000	4,000
Warranty provision	5,000	6,000	6,500
Warranty expenditure	(2,000)	(5,000)	(8,000)
Warranty liability (at end of period)	3,000	4,000	2,500

The tax base of a liability is its carrying value less the amount that *will* pass through future tax returns. (There is one exception to this, which is any form of revenue received in advance. These amounts are taxed when received—in other words, before income statement recognition—and the tax base becomes the carrying value of the liability less amounts that *will not* pass through tax returns in the future.)

Recall that we have assumed all of the year-end liability values for warranties are likely to pass through future tax returns as the expenditure is incurred. This will result in a zero value for the tax base in each year.

End of Period	Year 1	Year 2	Year 3
	$000	$000	$000
Carrying value	3,000	4,000	2,500
Tax base	0	0	0
Timing difference	3,000	4,000	2,500
DTA @ 30%	900	1,200	750
Δ DTA	+900	+300	−450

3. Income tax expense

Now that we have calculated the deferred tax items, we can illustrate how income tax expense was determined for financial statement reporting.

	Year 1	Year 2	Year 3
	$000	$000	$000
Tax payable	8,865	10,458	10,955
+Change in DTL	600	600	600
−Change in DTA	(900)	(300)	450
Tax expense	8,565	10,758	12,005

Realizability of Deferred Tax Assets

Although deferred taxes are created from temporary differences that are expected to reverse in the future, neither DTAs nor DTLs are carried on the balance sheet at their discounted present value. However, DTAs are assessed at each balance sheet date to determine the likelihood that the company will have sufficient future taxable income to recover the tax assets. Without future taxable income, a DTA is worthless.

If there is sufficient doubt that the benefits of DTAs will be realized in future periods, both IFRS and U.S. GAAP require companies to recognize the diminished value of the DTAs. Under IFRS, companies simply reduce a DTA, which increases tax expense in that period. U.S. GAAP employs different mechanics with the same result. Under U.S. GAAP, the full DTA is still carried on the balance sheet, but it must be reduced by a **valuation allowance**. The valuation allowance is a contra account that reduces the net balance sheet value of the DTA. Creating or increasing a valuation allowance increases income tax expense and decreases net income.

It is up to management to defend the valuation of all DTAs. If a company has order backlogs or existing contracts that are expected to generate future taxable income, a valuation allowance might not be necessary. However, if a company has cumulative losses over the past few years or a history of inability to use tax loss carryforwards, then the company likely needs to reduce its DTAs to reflect the likelihood they may never be realized. Because of the subjective nature of estimating future profitability, adjustments to DTAs could be a source of potential earnings management.

Treatment for Analytical Purposes

If DTLs are expected to reverse in the future, an analyst should treat them as liabilities. If, however, an analyst does not expect them to reverse in the foreseeable future (typically because of expected continued growth in capital expenditures), the recommended adjustment is to treat them as equity (decrease the DTL and increase equity by the same amount). The key question is, "When or will the total DTL be reversed in the future?" In practice, the treatment of deferred taxes for analytical purposes varies. An analyst must decide on the appropriate treatment on a case-by-case basis.

MODULE QUIZ 35.2

1. If the tax base of an asset exceeds the asset's carrying value and a reversal is expected in the future, then:

   A. a DTA is created.
   B. a DTL is created.
   C. neither a DTA nor a DTL is created.

2. Enigma KK uses straight-line depreciation in its accounts, while using accelerated depreciation for tax purposes. For both financial and tax reporting, the company assumes a five-year useful economic life and zero residual value. In the current year, accounting depreciation is ¥10,000,000 and tax allowable depreciation is ¥8,000,000. Which of the following statements relating to the impact of depreciation in the current year is *most accurate*?

   A. The DTL will increase.

B. The tax expense will be greater than tax payable.
C. The carrying value of the asset is greater than the tax base.

3. A U.S. GAAP reporting firm reports an increased valuation allowance at the end of the current period. What effect will this have on the firm's income tax expense in the current period?
   A. Increase.
   B. Decrease.
   C. No effect.
4. An analyst is comparing a firm to its competitors. The firm has a DTL that results from accelerated depreciation for tax purposes. The firm is expected to continue increasing its purchases of PP&E in the foreseeable future. How should the liability be treated for analysis purposes?
   A. It should be treated as equity at its full value.
   B. It should be treated as a liability at its full value.
   C. The present value should be treated as a liability, with the remainder being treated as equity.

MODULE 35.3: TAX RATES AND DISCLOSURES

Video covering this content is available online.

LOS 35.c: Calculate, interpret, and contrast an issuer's effective tax rate, statutory tax rate, and cash tax rate.

Some firms' reported income tax expense differs from the amount that would result from multiplying its earnings before taxes by the statutory income tax rate. Recall that the statutory rate is the tax rate of the jurisdiction where the firm operates. Any differences generally result from the following:

- Different tax rates in different tax jurisdictions (countries)
- Permanent tax differences: tax credits, tax-exempt income, nondeductible expenses, and tax differences between capital gains and operating income
- Changes in tax rates and legislation
- Tax holidays in some countries

Typically, temporary timing differences do not cause the statutory and effective rates to differ.

Analysts should consider the following three tax rates:

1. **Statutory tax rate:** corporate income tax rate in which the company is domiciled
2. $\text{Effective tax rate} = \dfrac{\text{income tax expense}}{\text{pretax income}}$
3. $\text{Cash tax rate} = \dfrac{\text{cash taxes paid}}{\text{pretax income}}$

The footnote disclosure in the financial statements must reconcile the statutory tax rate to the effective tax rate. Understanding the differences between reported income tax expense and the amount based on the statutory income tax rate will enable the analyst to better forecast future earnings and cash flow.

When estimating future earnings and cash flows, the analyst should understand each element of the reconciliation, including its relative impact, how it has changed with time, and how it is likely to change in the future.

When analyzing trends in tax rates, it is important to only include reconciliation items that are continuous in nature rather than those that are sporadic. Items such as different tax rates in different countries, tax-exempt income, and nondeductible expenses tend to be continuous. Other items are almost always sporadic, such as large asset sales and tax holiday savings. Watch for special conditions such as termination dates for a tax holiday or a requirement to pay the accumulated taxes at some point in the future. An analyst should review the disclosures of each financial statement based on the footnotes and management discussion and analysis.

EXAMPLE: Analyzing a tax rate reconciliation

Novelty Distribution Company (NDC) does business in the United States and abroad. NDC's reconciliation between effective and statutory tax rates for three years is provided in the following table. Analyze the changes in effective tax rates over the three years shown.

Statutory U.S. federal income tax rate reconciliation

	20X3	20X4	20X5
Statutory U.S. federal income tax rate	35.0%	35.0%	35.0%
State income taxes, net of related federal income tax benefit	2.1%	2.2%	2.3%
Benefits and taxes related to foreign operations	(6.5%)	(6.3%)	(2.7%)
Tax rate changes	0.0%	0.0%	(2.0%)
Capital gains on sale of assets	0.0%	(3.0%)	0.0%
Special items	(1.6%)	8.7%	2.5%
Other, net	0.8%	0.7%	(1.4%)
Effective income tax rates	29.8%	37.3%	33.7%

Answer:

In some cases an analyst may want to convert the reconciliation from percentages to absolute numbers. However, for this example, the trends can be analyzed simply by using the percentages.

The effective tax rate is upward trending over the three-year period. Contributing to the upward trend is an increase in the state income tax rate and a decrease in benefits related to taxes on foreign income. In 20X4, a loss related to the sale of assets partially offset an increase in taxes created by special items. In 20X3 and 20X5, the special items and the other items also offset each other. The fact that the special items and other items are so volatile over the three-year period suggests that it will be difficult for an analyst to forecast the effective tax rate for NDC for the foreseeable future without additional information. This volatility also reduces comparability with other firms.

LOS 35.d: Analyze disclosures relating to deferred tax items and the effective tax rate reconciliation and explain how information included in these disclosures affects a company's financial statements and financial ratios.

Companies are required to disclose details on the sources of the temporary differences that cause DTAs and DTLs to be reported on the balance sheet. Common examples of temporary differences include the following:

- A DTL results from using *accelerated depreciation for tax purposes* and straight-line depreciation for the financial statements. An analyst should consider the firm's growth rate and capital spending levels when determining whether the difference will actually reverse.
- *Impairments* generally result in a DTA because the write-down is recognized immediately in the income statement, but the deduction on the tax return is generally not allowed until the asset is sold or disposed of.
- *Restructuring* generates a DTA because the costs are recognized for financial reporting when the restructuring is announced, but they are not deducted for tax until actually paid. Restructuring usually results in significant cash outflows (net of the tax savings) in the years after the restructuring costs are reported.
- In the United States, firms that use LIFO for their financial statements are required to use LIFO for tax purposes, so no temporary differences result. However, in countries where this is not a requirement, temporary differences can result from the *choice of inventory cost flow method*.
- *Post-employment benefits* and *deferred compensation* are both recognized for financial reporting when earned by the employee, but they are not deducted for tax purposes until actually paid. These can result in a DTA that will be reversed when the benefits or compensation are paid.
- A deferred tax adjustment is made to stockholders' equity to reflect the future tax impact of unrealized gains or losses on *available-for-sale marketable securities* that are taken directly to equity. No DTL is added to the balance sheet for the future tax liability when gains or losses are realized.

Typically, the following deferred tax information is disclosed:

- DTLs, DTAs, any valuation allowance, and the net change in the valuation allowance over the period
- Any unrecognized DTL for undistributed earnings of subsidiaries and joint ventures
- Current-year tax effect of each type of temporary difference
- Components of income tax expense
- Reconciliation of reported income tax expense and the tax expense based on the statutory rate
- Tax loss carryforwards and credits

EXAMPLE: Analyzing deferred tax item disclosures

WCCO, Inc.'s, income tax expense has consistently been larger than taxes payable over the last three years. WCCO disclosed in the footnotes to its 20X5 financial statements the major items recorded as DTAs and DTLs (in millions of dollars), as shown in the following table.

Deferred tax disclosures

	20X5	20X4	20X3
Employee benefits	$278	$310	$290
International tax loss carryforwards	101	93	115
Subtotal	379	403	405
Valuation allowance	(24)	(57)	(64)
Deferred tax assets	355	346	341
Property, plant, and equipment	452	361	320
Unrealized gains on available-for-sale securities	67	44	23
Deferred tax liabilities	519	405	343
Deferred income taxes	$164	$59	$2

Given this information, explain why income tax expense has exceeded taxes payable over the last three years. Also explain the effect of the change in the valuation allowance on WCCO's earnings for 20X5.

Answer:

The company's DTA balance results from international tax loss carryforwards and employee benefits (most likely, pension and other post-retirement benefits), offset by a valuation allowance. The company's DTL balance results from property, plant, and equipment (most likely from using accelerated depreciation methods for tax and straight-line on the financial statements) and unrealized gains on securities classified as available for sale (because the unrealized gain is not taxable until realized).

Income tax expense is equal to taxes payable plus deferred income tax expense (change in DTLs minus change in DTAs). Because DTLs have been growing faster than DTAs, deferred income tax expense has been positive, resulting in income tax expense being higher than taxes payable.

Management decreased the valuation allowance by $33 million in 20X5. This resulted in a reduction in deferred income tax expense and an increase in reported earnings for 20X5. Decreasing the valuation allowance implies that management has increased its estimate of future taxable income against which it can use DTAs.

MODULE QUIZ 35.3

1. Which of the following rates is *most likely* to be useful for the analyst for forecasting future earnings?

   A. The statutory tax rate.

B. The effective tax rate.
C. The cash tax rate.

2. Valkyrie AG is a German company that has a wholly owned subsidiary in Italy. Valkyrie earns pretax income of €100 million in each country. If the tax rate in Germany is 30% and the tax rate in Italy is 20%, what is the company's effective tax rate?

A. 20%.
B. 25%.
C. 30%.

3. Reactor SA is a French firm with significant global operations:

Earnings Before Tax	Year 1	Year 2	Year 3
	€m	€m	€m
French operations	200	150	210
Overseas operations	50	75	90
Total	250	225	300

Income Taxes (Income Statement)	Year 1 €m	Year 2 €m	Year 3 €m
Current:			
French operations	56	30	59
Overseas operations	12	20	21
	68	50	80
Deferred:			
French operations	8	(4)	6
Overseas operations	(1)	2	2
	7	2	8
Total	75	48	88

The effective tax rate was highest in:

A. Year 1.
B. Year 2.
C. Year 3.

4. Which of the following is *least likely* to explain why the statutory and effective tax rates differ?

A. The presence of permanent timing differences.
B. Overseas business operations.
C. Changes in deferred tax assets (DTAs) and deferred tax liabilities (DTLs).

KEY CONCEPTS

LOS 35.a

Deferred tax terminology is as follows:

- *Taxable income.* Income subject to tax based on the tax return.
- *Accounting profit.* Pretax income from the income statement based on financial accounting standards.

- *Deferred tax assets (DTAs).* Balance sheet asset value that results when taxes payable (tax return) are greater than income tax expense (income statement) and the difference is expected to reverse in future periods.
- *Deferred tax liabilities (DTLs).* Balance sheet liability value that results when income tax expense (income statement) is greater than taxes payable (tax return) and the difference is expected to reverse in future periods.
- *Valuation allowance.* Reduction of DTAs (contra account) based on the likelihood that the future tax benefits will not be realized.
- *Taxes payable.* The tax liability from the tax return. Note that this term also refers to a liability that appears on the balance sheet for taxes due but not yet paid.
- *Income tax expense.* Expense recognized in the income statement that includes taxes payable and changes in DTAs and DTLs.

If taxable income is less than pretax income and the cause of the difference is expected to reverse in future years, a DTL is created. If taxable income is greater than pretax income and the difference is expected to reverse in future years, a DTA is created.

The balance of a DTA or DTL is equal to the difference between the tax base and the carrying value of the asset or liability, multiplied by the tax rate.

Income tax expense and taxes payable are related through the change in the DTA and the change in the DTL:

$$\text{income tax expense} = \text{taxes payable} + \Delta\text{DTL} - \Delta\text{DTA}$$

A permanent difference is a difference between taxable income and pretax income that will not reverse in the future. Permanent differences do not create DTAs or DTLs.

When a firm's enacted tax rate increases (decreases), DTAs and DTLs are both increased (decreased) to reflect the new rate. Changes in these values will also affect income tax expense.

LOS 35.b

A DTL is created when income tax expense (income statement) is higher than taxes payable (tax return). Deferred tax liabilities occur when revenues (or gains) are recognized in the income statement before they are taxable on the tax return, or expenses (or losses) are tax deductible before they are recognized in the income statement.

A DTA is created when taxes payable (tax return) are higher than income tax expense (income statement). DTAs are recorded when revenues (or gains) are taxable before they are recognized in the income statement, when expenses (or losses) are recognized in the income statement before they are tax deductible, or when tax loss carryforwards are available to reduce future taxable income.

The tax base for a depreciable fixed asset is the amount of tax-allowable depreciation that will be deducted in future tax returns.

The tax base of a liability is equal to the liability's carrying value less amounts that will be included in future taxable income. With liabilities relating to income received in

advance, the tax base is equal to the carrying value of the liability less any amounts that will not be included in future taxable income.

Asset carrying value > tax base	Deferred tax liability
Asset carrying value < tax base	Deferred tax asset
Liability carrying value > tax base	Deferred tax asset
Liability carrying value < tax base	Deferred tax liability

If it is more likely than not that some or all of a DTA will not be realized (because of insufficient future taxable income to recover the tax asset), then the gross DTA must be reduced by a valuation allowance under U.S. GAAP. Under IFRS a firm reports a smaller DTA if future recoverability is uncertain but does not report a valuation allowance.

DTLs that are not expected to reverse, typically because of expected continued growth in capital expenditures, should be treated for analytical purposes as equity. If DTLs are expected to reverse, they should be treated for analytical purposes as liabilities.

LOS 35.c

Firms are required to reconcile their effective income tax rate with the applicable statutory rate in the country where the business is domiciled. Analyzing trends in individual reconciliation items can aid in understanding past earnings trends and in predicting future effective tax rates. Where adequate data are provided, they can also be helpful in predicting future earnings and cash flows, or for adjusting financial ratios.

Tax rates are as follows:

1. Statutory tax rate: corporate income tax rate in which the company is domiciled
2. $\text{Effective tax rate} = \dfrac{\text{income tax expense}}{\text{pretax income}}$
3. $\text{Cash tax rate} = \dfrac{\text{cash taxes paid}}{\text{pretax income}}$

LOS 35.d

Typically, the following deferred tax information is disclosed in the footnotes:

- DTLs, DTAs, any valuation allowance, and the net change in the valuation allowance over the period
- Any unrecognized DTL for undistributed earnings of subsidiaries and joint ventures
- Current-year tax effect of each type of temporary difference
- Components of income tax expense
- Reconciliation of reported income tax expense and the tax expense based on the statutory rate
- Tax loss carryforwards and credits

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 35.1

1. **C** Pretax income and income tax expense are not always linked because of temporary and permanent differences. (LOS 35.a)

2. **C** Timing differences that do not reverse, referred to as permanent differences, do not result in the creation of DTAs or DTLs. If the timing difference was expected to reverse, a DTL would be created because carrying value > tax base. (LOS 35.a)

3. **A** Expenses that are tax deductible before they are recognized in the income statement result in deferred tax liabilities. For example, accelerated depreciation in the tax returns versus straight-line depreciation in the accounts results in more depreciation being recognized in the tax returns, in early periods, and results in carrying value exceeding the tax base. If revenues or gains are taxable before they are recognized in the income statement, DTAs are created. Unearned revenue is a good example of this. Tax loss carryforwards result from negative taxable income. Rather than triggering the tax authorities to pay tax to the firm, they are deferred and can be offset against future taxable income. As a result, the firm will pay less tax in the future, and a DTA is created. (LOS 35.a)

4. **B** The doubtful debt provision reduces the balance sheet carrying value, but not the tax base of receivables. If the tax base of the asset is greater than the carrying value, this results in a DTA. (LOS 35.a)

5. **C** The income statement tax expense = tax payable + ΔDTL − ΔDTA.

   Increases in DTLs increase the tax expense, and increases in DTAs reduce the tax expense. The opposite is true of decreases.

   $$\text{Change in DTA: } \$300{,}000 - \$350{,}000 = -\$50{,}000$$
   $$\text{Change in DTL: } \$500{,}000 - \$400{,}000 = \$100{,}000$$
   $$\text{Tax expense} = \$500{,}000 + \$100{,}000 - (-\$50{,}000) = \$650{,}000$$

   (LOS 35.a)

6. **B** An increase in the tax rate will increase any DTAs and DTLs. (LOS 35.a)

Module Quiz 35.2

1. **A** If the tax base of an asset exceeds the carrying value, a DTA is created. Taxable income will be lower in the future when the reversal occurs. (LOS 35.b)

2. **C** The carrying value is higher than the tax base of the asset due to the use of accelerated depreciation in the tax returns versus straight-line in the accounts. As this year's tax allowable depreciation is now lower than this year's accounting depreciation, the DTL will begin to decline. Decreases in the DTL reduce the tax expense. The difference between carrying value and tax base will decrease as the timing difference reverses until, at the end of the asset's life, they both equal zero. (LOS 35.b)

3. **A** Recognizing a greater valuation allowance reduces the net value of a DTA, which increases income tax expense in the current period. (LOS 35.b)

4. **A** The DTL is not expected to reverse in the foreseeable future because the firm is expected to continue to increase its investment in depreciable assets, and accelerated depreciation for tax on the newly acquired assets delays the reversal of the DTL. The liability should be treated as equity at its full value. (LOS 35.b)

Module Quiz 35.3

1. **B** The effective rate is most useful for forecasting future earnings; however, it may need to be adjusted to remove the impact of transitory components. The statutory rate is the tax rate where the company is domiciled for reporting purposes. The cash tax rate is most applicable when forecasting future tax payments and cash flows. (LOS 35.c)

2. **B** $\text{Tax in Germany} = €100 \text{ million} \times 30\% = €30 \text{ million}$

   $\text{Tax in Italy} = €100 \text{ million} \times 20\% = €20 \text{ million}$

   $$\text{Effective tax rate} = \frac{30 + 20}{100 + 100} = \frac{50}{200} = 25\%$$

   (LOS 35.c)

3. **A** The effective tax rate is measured as the tax expense divided by earnings before tax.

   $$\text{Year 1} = \frac{€75 \text{ million}}{€250 \text{ million}} = 0.3 = 30\%$$

   $$\text{Year 2} = \frac{€48 \text{ million}}{€225 \text{ million}} = 0.213 = 21.3\%$$

   $$\text{Year 3} = \frac{€88 \text{ million}}{€300 \text{ million}} = 0.293 = 29.3\%$$

   (LOS 35.c)

4. **C** Changes in DTAs and DTLs do not cause statutory and effective rates to differ. Permanent timing differences do cause the rates to differ, as these items affect either taxable income or pretax earnings, but not both. Overseas business operations result in tax being paid to overseas tax authorities, which are unlikely to have the same statutory rate as the firm's domicile country. (LOS 35.c)

READING 36

FINANCIAL REPORTING QUALITY

MODULE 36.1: REPORTING QUALITY

Video covering this content is available online.

LOS 36.a: Compare financial reporting quality with the quality of reported results (including quality of earnings, cash flow, and balance sheet items).

Financial reporting quality refers to the characteristics of a firm's financial statements. The primary criterion for judging financial reporting quality is adherence to generally accepted accounting principles (GAAP) in the jurisdiction in which the firm operates. However, given that GAAP provide choices of methods, estimates, and specific treatment of many items, compliance with GAAP by itself does not necessarily result in financial reporting of the highest quality.

High quality financial reporting must be *decision useful*. Two characteristics of decision-useful financial reporting are *relevance* and *faithful representation*. Relevance refers to the fact that information presented in the financial statements is useful to users of financial statements in making decisions. Relevant information must also be *material* in that knowledge of it would likely affect the decisions of users of financial statements. Faithful representation encompasses the qualities of *completeness*, *neutrality*, and the absence of errors. We develop the concept of neutrality of financial reports later in this reading.

The **quality of earnings** is, in many respects, a separate issue. The quality of reported earnings (not the quality of earnings reports) can be judged based on the sustainability of the earnings as well as on their level. Sustainability can be evaluated by determining the proportion of reported earnings that can be expected to continue in the future. Increases in reported earnings resulting from changes in exchange rates or by sales of assets that have appreciated over many periods are not typically sustainable, whereas higher profits from increased efficiency or increasing market share would generally be considered sustainable.

One dollar of high-quality earnings is expected to add more value to a company than one dollar of low-quality earnings, based on the criterion of sustainability. The higher probability that high-quality earnings will continue in future periods increases their impact on the value of the firm, calculated as the present value of expected future earnings. At the other end of the sustainability spectrum, a one-time gain of a dollar

from favorable currency exchange rate movements is not likely to be repeated and, therefore, has a smaller impact on estimates of a company's value.

The importance of the level of earnings is that reported earnings must be high enough to sustain the company's operations and existence over time, as well as high enough to provide an adequate return to the company's investors. Both of these concerns are important in determining the quality of a company's reported earnings. Sustainability of reported cash flows is also a consideration in determining the quality of reported earnings, as are the value of items reported on the balance sheet. Inadequate accruals for probable liabilities and overstatement of asset values can both decrease the quality of reported earnings and bring sustainability into question.

From our discussion here, we can see that it is quite possible that a firm has high financial reporting quality but a low quality of reported earnings. Reported earnings may be GAAP-compliant and relevant, represent the company's economic activities faithfully, and be decision useful as a result, but have low sustainability or be low enough in amount that the provision of adequate investor returns or the sustainability of the company itself are called into question.

LOS 36.b: Describe a spectrum for assessing financial reporting quality.

Combining both financial reporting quality and the quality of reported earnings, we can categorize the quality of financial reports along a spectrum from best to worst. At the high-quality end of the spectrum, we have financial reports that are compliant with GAAP, decision useful, and report earnings that are sustainable and represent an adequate return on invested capital. At the opposite end of the spectrum are financial reports that are essentially fictitious (fraudulent). When reporting quality is that low, the quality of the reported earnings themselves is impossible to assess. We can identify several levels of quality between these two extremes.

Here is one possible categorization of the quality levels of financial reports, from best to worst:

1. Reporting is compliant with GAAP and decision useful; earnings are sustainable and adequate.
2. Reporting is compliant with GAAP and decision useful, but earnings quality is low (earnings are not sustainable or not adequate).
3. Reporting is compliant with GAAP, but earnings quality is low and reporting choices and estimates are biased.
4. Reporting is compliant with GAAP, but the amount of earnings is actively managed to increase, decrease, or smooth reported earnings.
5. Reporting is not compliant with GAAP, although the numbers presented are based on the company's actual economic activities.
6. Reporting is not compliant and includes numbers that are essentially fictitious or fraudulent.

LOS 36.c: Explain the difference between conservative and aggressive accounting.

Ideally, financial statements should be neutral or unbiased in order to offer the most value to analysts. In general, we describe the choices made within GAAP with respect to reported earnings as **conservative accounting** if they tend to decrease the company's reported earnings and financial position (on the balance sheet) for the current period. We describe choices that increase reported earnings or improve the financial position for the current period as **aggressive accounting**.

Aggressive accounting often results in decreased earnings in future periods, while conservative accounting will tend to increase future period earnings. Both these types of bias are sometimes used by management, for different periods, in an attempt to smooth earnings over time because greater earnings volatility tends to reduce the value of a company's shares. Often **earnings smoothing** is accomplished through adjustment of accrued liabilities that are based on management estimates. During periods of higher-than-expected earnings, management may employ a conservative bias by adjusting an accrued liability upward to reduce reported earnings for that period. This effectively allows deferral of the recognition of these earnings to a future period for which earnings are less than expected. In such a future period, the accrued liability is adjusted downward to increase reported earnings in that period, perhaps to meet market expectations. Deferral of reported earnings through conservative bias in financial reporting so they can be used opportunistically in a future period is sometimes referred to as putting earnings in the "cookie jar" (presumably to be "enjoyed" later).

Some examples of conservative versus aggressive financial reporting based on management choices and estimates are shown in Figure 36.1.

Figure 36.1: Aggressive and Conservative Accounting

Aggressive	Conservative
Capitalizing current period costs	Expensing current period costs
Longer estimates of the lives of depreciable assets	Shorter estimates of the lives of depreciable assets
Higher estimates of salvage values	Lower estimates of salvage values
Straight-line depreciation	Accelerated depreciation
Delayed recognition of impairments	Early recognition of impairments
Less accrual of reserves for bad debt	More accrual of reserves for bad debt
Smaller valuation allowances on deferred tax assets	Larger valuation allowances on deferred tax assets

Bias can also be present in the way that financial results are presented. A company may present transparent financial statements that help analysts and investors to understand the results and the activities that led to them. Alternatively, a company may provide minimal disclosure in an attempt to emphasize positive developments and obscure information about negative developments.

We should avoid thinking about conservatism in financial reporting as "good" and aggressive reporting as "bad." Conservative bias can also be considered as a deviation from neutral reporting or faithful representation that reduces the usefulness of financial statements to analysts and investors.

Sometimes GAAP themselves can introduce conservatism by imposing a higher standard of verification for revenue and profit than for expenses and accrual of liabilities. For example:

- Research costs are typically expensed in the period incurred because of the uncertainty about the future benefits to be provided from research activities, while the associated revenue is not recognized until some future period.
- Accruals for legal liabilities are recorded when a future payment becomes "probable," while the standard for recognizing increasing accrued asset value is stricter.
- Under U.S. GAAP, write-downs of inventory values are required when their future value is likely impaired, but increases in inventory value may not be recorded until the inventory is actually sold.

While conservative bias in financial reporting is not ideal for users of financial statements, it may be beneficial in reducing the probability of future litigation from users claiming they were misled, in reducing current period tax liability (when deductions for tax must also be deducted in the financial statements), and in protecting the interests of those who have less complete information than company management, such as buyers of the company's debt.

LOS 36.d: Describe motivations that might cause management to issue financial reports that are not high quality and conditions that are conducive to issuing low-quality, or even fraudulent, financial reports.

One important motivation for aggressive accounting choices is to meet or exceed a benchmark number for earnings per share. Specifically, managers may be motivated to report earnings that are greater than:

- Earnings guidance offered earlier by management.
- Consensus analyst expectations.
- Those of the same period in the prior year.

The manager's motivation here may be career oriented, seeking to enhance her reputation and improve future career opportunities. Because beating certain benchmarks is important to subsequent stock price movements, managers may be motivated by incentive compensation (bonuses) that depends on stock returns. Other possible motivations are to gain credibility with equity market investors or improve the way the company is viewed by its customers and suppliers.

For companies that are highly leveraged and unprofitable, aggressive accounting may be motivated by a desire to avoid violating debt covenants.

When earnings exceed benchmark levels, managers may make conservative accounting choices in ways that allow these earnings to be shown in future periods, increasing the

probability that future period earnings will meet or exceed the relevant benchmark amount.

Three factors that typically exist in cases where management provides low-quality financial reporting are motivation, opportunity, and a rationalization of the behavior. So to the sources of *motivation* previously listed, we can add conditions that increase the *opportunity* to present low-quality financial reports. Circumstances in which low-quality, or even fraudulent, financial reporting is more probable are:

- The company has weak internal controls.
- The board of directors provides inadequate oversight.
- Applicable accounting standards provide a large range of acceptable accounting treatments, provide for inconsequential penalties in the case of accounting fraud, or both.

The third likely element of low-quality financial reporting is *rationalization* by management for less-than-ethical actions. Most people who do something they know is wrong tell themselves a story that seems (at least to them) to justify breaking the rules. Whether the story is "I'll fix it next period" or "I have to do it to get my bonus and pay for my parents' care," the resulting behavior is the same.

LOS 36.e: Describe mechanisms that discipline financial reporting quality and the potential limitations of those mechanisms.

Each country has its own regulatory body responsible for publicly traded securities and the markets in which they trade. For example, in the United States, the regulatory body is the Securities and Exchange Commission (SEC). In the U.K., it is the Financial Conduct Authority (FCA). The International Organization of Securities Commissions (IOSCO) coordinates securities regulation on an international basis with over 200 members, such as national securities regulators, stock exchanges, and regional authorities. One such regional authority, the European Securities and Markets Authority (ESMA), coordinates policy among the securities regulators of countries in the European Union.

Securities regulations typically require:

- A registration process for the issuance of new publicly traded securities.
- Specific disclosure and reporting requirements, including periodic financial statements and accompanying notes.
- An independent audit of financial reports.
- A statement of financial condition (or management commentary) made by management.
- A signed statement by the person responsible for the preparation of the financial reports.
- A review process for newly registered securities and periodic reviews after registration.

Enforcement actions by securities regulators may include fines, suspension of participation in issuance and trading of securities, and public disclosure of the results of disciplinary proceedings. Regulators may also pursue criminal prosecution of fraudulent or otherwise illegal activities.

In addition to the audit opinion, a requirement for securities that trade in the United States is that management must include an assessment of the effectiveness of the firm's internal controls.

Note that an unqualified or "clean" audit opinion is not a guarantee that no fraud has occurred but only offers reasonable assurance that the financial reports (prepared the under the direction of management) have been "fairly reported" with respect to the applicable GAAP. The auditor is selected and paid by the firm being audited.

Another source of discipline on financial reporting quality is private contracts, such as those with lenders. Such contracts will often specify how financial measures referenced in the loan covenants will be calculated. The counterparties to private contracts with the firm have an incentive to see that the firm produces high-quality financial reports.

LOS 36.f: Describe presentation choices, including non-GAAP measures, that could be used to influence an analyst's opinion.

Firms will sometimes report accounting measures that are not defined or required under GAAP. Such **non-GAAP measures** typically exclude some items in order to make the firm's performance look better than it would using measures defined and required by GAAP. The claim is often made that certain items are excluded because they are one-time or nonoperating costs that will not affect operating earnings going forward, because the items are non-cash charges, or to "improve comparability with companies that use different accounting methods" for depreciation or restructuring charges.

In the United States, companies that report non-GAAP measures in their financial statements are required to:

- Display the most comparable GAAP measure with equal prominence.
- Provide an explanation by management as to why the non-GAAP measure is thought to be useful.
- Reconcile the differences between the non-GAAP measure and the most comparable GAAP measure.
- Disclose other purposes for which the firm uses the non-GAAP measure.
- Include, in any non-GAAP measure, any items that are likely to recur in the future, even those treated as nonrecurring, unusual, or infrequent in the financial statements.

IFRS require that firms using non-IFRS measures in financial reports must:

- Define and explain the relevance of such non-IFRS measures.
- Reconcile the differences between the non-IFRS measure and the most comparable IFRS measure.

Overall, the supposition is that firms use non-GAAP measures in an attempt to control the metrics on which they are evaluated and to reduce the focus of analysts and investors on GAAP measures.

MODULE QUIZ 36.1

1. A firm reports net income of $40 million. The firm's financial statements disclose in Management's Discussion and Analysis that $30 million of net income is attributable to a gain on the sale of assets. Based only on this information, for this period, the firm is *best* described as having high quality of:
   A. financial reporting only.
   B. both earnings and financial reporting.
   C. neither earnings nor financial reporting.
2. Which of the following financial reports are considered to be of the lowest quality? Financial reports that reflect:
   A. unsustainable earnings.
   B. biased accounting choices.
   C. departures from accounting principles.
3. Financial reporting is *most likely* to be decision useful when management's accounting choices are:
   A. neutral.
   B. aggressive.
   C. conservative.
4. Which of the following is *least likely* to be a motivation to overreport earnings?
   A. Reduce tax obligations.
   B. Meet analyst expectations.
   C. Remain in compliance with bond covenants.
5. With respect to conditions that may lead to low-quality financial reporting, ineffective internal controls are *best* described as a(n):
   A. motivation.
   B. opportunity.
   C. rationalization.
6. A limitation on the effectiveness of auditing in ensuring financial reporting quality is that:
   A. detecting fraud is not the objective of audits.
   B. public firms are not required to obtain audit opinions.
   C. auditors may only issue a qualified or unqualified opinion but do not explain why.
7. Under IFRS, a firm that presents a nonstandard financial measure is *least likely* required to:
   A. provide the same measure for at least two prior periods.
   B. explain the reasons for presenting the nonstandard measure.
   C. reconcile the nonstandard measure to a comparable standard measure.

MODULE 36.2: ACCOUNTING CHOICES AND ESTIMATES

LOS 36.g: Describe accounting methods (choices and estimates) that could be used to manage earnings, cash flow, and balance

Video covering this content is

Revenue Recognition

One example of how a firm's choices affect the timing of revenue recognition is the choice of where in the shipping process the customer actually takes title to the goods. A firm may choose terms with their customer of **free-on-board (FOB)** at the shipping point (the firm's loading dock) or FOB at the destination (the customer's location). Choosing terms of FOB at the shipping point will mean that revenue is recognized earlier compared to FOB at the destination.

Firms can also manage the timing of revenue recognition by accelerating or delaying the shipment of goods. If additional revenue is required to meet targets, firms can offer discounts or special financing terms to increase orders in the current period, or ship goods to distributors without receiving an order. Overloading a distribution channel with more goods than would normally be sold during a period is referred to as **channel stuffing**. In periods where high earnings are expected, management may wish to delay recognition of revenue to the next period and hold or delay customer shipments to achieve this.

In a **bill-and-hold transaction**, the customer buys the goods and receives an invoice but requests that the firm keep the goods at their location for a period of time. The use of fictitious bill-and-hold transactions can increase earnings in the current period by recognizing revenue for goods that are actually still in inventory. Revenue for future periods will be decreased as real customer orders for these bill-and-hold items are filled but not recognized in revenue, offsetting the previous overstatement of revenue.

Estimates of Credit Losses

One example of accounting choices that affect financial reports is the estimation of losses from uncollectable customer credit accounts. On the balance sheet, the reserve for uncollectible debt is an offset to accounts receivable. If management determines the probability that accounts receivable will be uncollectible is lower than their current estimate, a decrease in the reserve for uncollectible accounts will increase net receivables reported on the balance sheet, reduce expenses on the income statement, and increase net income. An increase in the allowance for bad debt would have the opposite effect, decreasing net receivables on the balance sheet, increasing expenses, and decreasing net income.

A firm that simply underestimates the percentage of receivables that will be uncollectible will report higher receivables and higher net income as a result. At some point, when actual uncollectible accounts exceed the low estimate, the firm will report an additional expense that will reduce net income and net receivables.

Management can adjust the bad-debt reserve in order to smooth earnings. In periods of high earnings, the allowance for bad debt is increased to reduce reported earnings, in effect storing these earnings for later use. In subsequent periods, if earnings are below benchmark values, the bad-debt reserve can be reduced to meet earnings targets.

Other reserves recorded by a company, such as a reserve for warranty expense, can also be changed to manage reported earnings. A decrease in the estimated warranty expense as a percentage of sales will increase earnings, while an increase in the reserve for warranty expense will decrease earnings for the period.

Valuation Allowance

Another example of a contra account that can be used to manage earnings is a valuation allowance. Recall that a valuation allowance reduces the carrying value of a deferred tax asset based on the probability it will not be realized. Similar to the effects of an allowance for bad debt, increasing a valuation allowance will decrease the net deferred tax asset on the balance sheet and reduce net income for the period, while a decrease in the valuation allowance will increase the net deferred tax asset and increase net income for the period.

As with the contra account for bad debt, the valuation allowance can be understated to show higher asset values and adjusted over time to smooth earnings.

Depreciation Methods and Estimates

Compared to straight-line depreciation, using an accelerated method of depreciation increases expenses, and decreases net income, in the early years of an asset's life. In the later years of an asset's life, expenses are lower and net income higher when an accelerated depreciation method is used. The carrying value of a depreciable asset on the balance sheet will decrease more rapidly with accelerated depreciation than with straight-line depreciation.

Estimates of the useful life of a depreciable asset and its salvage value upon disposal can also affect net income and the carrying value of the asset. A greater salvage value will slow depreciation so the carrying value of the asset is greater, depreciation expense is less, and net income is higher. A smaller salvage value will have the opposite effects. If the salvage value of an asset is set higher than the actual sale price at the end of the asset's life, a loss on the sale of the asset will decrease net income in the period in which the asset is sold.

Using a longer estimated useful life of a depreciable asset decreases the periodic depreciation expense and increases net income in the early years of the asset's life compared to using a shorter estimated useful life.

Amortization and Impairment

Management choices and estimates regarding amortization of purchased intangible assets are similar to those for depreciation of tangible assets. The intangible asset *goodwill* is not amortized but is subject to a test for impairment. By ignoring or delaying recognition of an impairment charge for goodwill, management can increase earnings in the current period.

Inventory Method

The choice of inventory cost flow methods can have significant effects on both reported earnings and the balance sheet value of inventory. Consider the choice between FIFO and weighted-average inventory costing methods. During periods of rising prices, COGS under the FIFO method will be less than COGS under the weighted-average costing method. Gross profit, gross margin, and earnings will all be greater under the FIFO method than under the weighted-average method as a result. Balance sheet inventory value will be greater under FIFO than under the weighted-average method.

During periods of decreasing prices, the opposite is true; FIFO COGS are greater than weighted-average COGS and FIFO gross profits, gross margin, and earnings less than under the weighted-average method. With decreasing prices, balance sheet inventory will be less under FIFO than under the weighted-average cost method.

In terms of relevance, in an environment of either increasing or decreasing prices, FIFO results in more accurate balance sheet inventory values because inventory value is closer to current replacement cost than under the weighted average cost method. Conversely, COGS are closer to current (replacement) cost under the weighted-average cost method so that gross profit and margin better reflect economic reality. Gross profit under FIFO is distorted in that it includes gains from rising prices (or losses from decreasing prices), so the weighted-average cost method produces "better" information on the income statement. Financial reports that are transparent and provide users with the information needed to understand how the choice of inventory costing method affects income statement and balance sheet values are considered to be higher quality.

Related-Party Transactions

If a public firm does business with a supplier that is private and controlled by management, adjusting the price of goods supplied can shift profits either to or from the private company to manage the earnings reported by the public company.

Capitalization

Any expense that can be capitalized creates an asset on the balance sheet, and the impact of the expense on net income can be spread over many years. Consider a firm that has a marketing expense of $1.5 million and chooses to capitalize this expense and amortize it over three years. In the period in which the expense is incurred, capitalization will reduce the expense on the income statement from $1.5 million to $0.5 million, increasing pretax income by $1 million. At the end of the year, the related balance sheet asset is $1 million, and an amortization expense of $0.5 million will be taken (and reduce net income) in each of the following two years. Greater capitalization of research and development costs will shift net income into the current period in the same way.

Capitalization also affects cash flow classifications. If an expense is capitalized, the entire amount is classified as an investing cash outflow so that operating cash flow is increased by that amount.

Other Cash Flow Effects

Management can affect the classification of cash flows through other methods, primarily with the goal of increasing reported cash flow from operations. Taking longer to pay suppliers increases operating cash flows and is referred to as **stretching payables**. Delaying payments that would normally be made near the end of a reporting period until the beginning of the next accounting period will increase operating cash flow in the current period and reduce it in the subsequent period. There is no effect on reported earnings in the current period from stretching payables.

Capitalizing interest expense will decrease cash flow from investing and increase cash flow from operations, along with its effects on the pattern of earnings from depreciating the interest expense over time rather than expensing it all in the current period. More generally, the ability under IFRS to classify interest and dividends paid as either CFO or CFF, and interest and dividends received as either CFO or CFI, gives management an additional way to manage reported operating cash flow.

MODULE 36.3: WARNING SIGNS

LOS 36.h: Describe accounting warning signs and methods for detecting manipulation of information in financial reports.

Video covering this content is available online.

Following is a list of several warning signs that analysts should look for. The presence of these issues does not indicate fraud or even earnings manipulation, but in each case, the presence of one or more warning signs requires more analysis in order to determine whether there is a real business reason for the item or if earnings manipulation or fraud is driving the decisions and results. Avoiding investment in the company is one alternative when analysts and investors cannot obtain satisfactory answers to the questions raised when multiple warning signs are present.

Revenue Recognition

- Changes in revenue recognition methods.
- Use of bill-and-hold transactions.
- Use of barter transactions.
- Use of rebate programs that require estimation of the impact of rebates on net revenue.
- Lack of transparency with regard to how the various components of a customer order are recorded as revenue.
- Revenue growth out of line with peer companies.
- Receivables turnover is decreasing over multiple periods.
- Decreases in total asset turnover, especially when a company is growing through acquisition of other companies.
- Inclusion of nonoperating items or significant one-time sales in revenue.

Inventories

- Declining inventory turnover ratio.
- LIFO liquidations—drawing down inventory levels when LIFO (U.S. GAAP only) inventory costing is used so that COGS reflects the lower costs of items acquired in past periods, which increases current period earnings.

Capitalization Policies

- Firm capitalizes costs that are not typically capitalized by firms in their industry.

Relationship of Revenue and Cash Flow

- The ratio of operating cash flow to net income is persistently less than one or declining over time.

Other Warning Signs

- Depreciation methods, estimated asset lives, or estimates of salvage values are out of line with those of peer companies in the industry.
- Fourth-quarter earnings show a pattern (either high or low) compared to the seasonality of earnings in the industry or seasonality of revenue for the firm.
- The firm has significant transactions with related parties (entities controlled by management).
- Certain expenses are classified as nonrecurring but appear regularly in financial reports.
- Gross or operating profit margins are noticeably higher than are typical for the industry and peer companies.
- Management typically provides only minimal financial reporting information and disclosure.
- Management typically emphasizes non-GAAP earnings measures and uses special or nonrecurring designations aggressively for charges.
- Growth by purchasing a large number of businesses can provide many opportunities to manipulate asset values and future depreciation and amortization and make comparisons to prior period earnings problematic.

Analysts should consider adjusting prior-period earnings when large restructuring or impairment charges are recognized. Analysts sometimes take such events to be good news because they anticipate better firm performance going forward when poorly performing assets are disposed of. Because the charges represent, to some extent, "corrections" of previously understated expenses and overstated asset values, analysts should consider spreading these costs across prior periods and restating prior earnings to give a more realistic picture of true earnings trends.

MODULE QUIZ 36.2, 36.3

1. For the current period, inappropriate capitalization is *most likely* to:

A. overstate revenues.
B. understate liabilities.
C. understate expenses.

2. A potential warning sign that a firm is engaging in channel stuffing is an unusual increase in the firm's:

A. receivables turnover.
B. days of sales outstanding.
C. number of days of payables.

KEY CONCEPTS

LOS 36.a

Financial reporting quality refers to the characteristics of a firm's financial statements. High-quality financial reporting adheres to generally accepted accounting principles (GAAP) and is decision useful in terms of relevance and faithful representation.

Quality of reported results refers to the level and sustainability of a firm's earnings, cash flows, and balance sheet items. High-quality earnings are high enough to provide the firm's investors with an adequate return and are sustainable in future periods.

LOS 36.b

A spectrum for assessing financial reporting quality considers both the quality of a firm's financial statements and the quality of its earnings. One such spectrum, from highest quality to lowest, is the following:

- Reporting is compliant with GAAP and decision useful; earnings are sustainable and adequate.
- Reporting is compliant and decision useful, but earnings quality is low.
- Reporting is compliant, but earnings quality is low and reporting choices and estimates are biased.
- Reporting is compliant, but earnings are actively managed.
- Reporting is not compliant, but the numbers presented are based on the company's actual economic activities.
- Reporting is not compliant and includes numbers that are fictitious or fraudulent.

LOS 36.c

Biased accounting choices that can be made within GAAP include conservative and aggressive accounting. Conservative accounting choices tend to decrease the company's reported earnings and financial position for the current period. Aggressive accounting choices tend to increase reported earnings or improve the financial position for the current period.

Some managers employ conservative bias during periods when earnings are above target and aggressive bias during poor periods of below-target earnings to artificially smooth earnings.

LOS 36.d

Motivations for firm managers to issue low-quality financial reports may include pressure to meet or exceed earnings targets, career considerations, increasing their compensation, improving perceptions of the firm among customers and suppliers, or meeting the terms of debt covenants.

Conditions that are often present when managers issue low-quality financial reports include motivations, opportunities, and rationalizations. Weak internal controls, inadequate oversight by the board of directors, and wide ranges of acceptable accounting treatments are among the factors that may provide opportunities for low-quality reporting.

LOS 36.e

Mechanisms that help to discipline financial reporting quality include regulation, auditing, and private contracts. Regulators typically require public companies to provide periodic financial statements and notes, including management commentary, and obtain independent audits.

A clean audit opinion offers reasonable assurance that financial statements are free from material errors but does not guarantee the absence of error or fraud. The fact that firms select and pay their auditors may limit the effectiveness of auditing to discipline financial reporting quality.

LOS 36.f

Firms may attempt to influence analysts' valuations by presenting non-GAAP measures, such as earnings that exclude certain nonrecurring items. IFRS requires firms to define and explain the relevance of any non-GAAP measures and reconcile them to the most comparable IFRS measure. Similar requirements apply to U.S. public firms.

LOS 36.g

Accounting choices and estimates that can be used to manage earnings include:

- Revenue recognition choices such as shipping terms (FOB shipping point versus FOB destination), accelerating shipments (channel stuffing), and bill-and-hold transactions.
- Estimates of reserves for uncollectible accounts or warranty expenses.
- Valuation allowances on deferred tax assets.
- Depreciation methods, estimates of useful lives and salvage values, and recognition of impairments.
- Inventory cost flow methods.
- Capitalization of expenses.
- Related-party transactions.

LOS 36.h

Accounting warning signs that indicate a need for closer analysis may include:

- Revenue growth out of line with comparable firms, changes in revenue recognition methods, or lack of transparency about revenue recognition.
- Decreases over time in turnover ratios (receivables, inventory, total asset).
- Bill-and-hold, barter, or related-party transactions.
- Net income not supported by operating cash flows.
- Capitalization decisions, depreciation methods, useful lives, salvage values out of line with comparable firms.
- Fourth-quarter earnings patterns not caused by seasonality.
- Frequent appearance of nonrecurring items.
- Emphasis on non-GAAP measures, minimal information and disclosure in financial reports.

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 36.1

1. **A** Because a large proportion of net income is due to a one-time gain, this period's earnings are likely not sustainable and the firm may be said to have low quality of earnings for the period. Clear disclosure of this fact in the financial statements suggests high quality of financial reporting. (LOS 36.a)

2. **C** In the spectrum of financial reporting quality, financial reports that depart from generally accepted accounting principles are considered to be of lower quality than those that reflect biased accounting choices. Financial reports that reflect unsustainable earnings, such as one-time gains, can still be of high quality if they state the situation clearly. (LOS 36.b)

3. **A** Financial reporting is most likely to be decision useful when accounting choices are neutral. Either aggressive or conservative accounting choices by management may be viewed as biases. (LOS 36.c)

4. **A** Reducing tax obligations would be a reason to *underreport* earnings. The other choices are motivations to overreport earnings. (LOS 36.d)

5. **B** Ineffective internal controls are a condition that provides an opportunity for low-quality financial reporting. (LOS 36.d)

6. **A** The objective of audits is to provide reasonable assurance that financial statements are presented fairly. A firm that is engaging in accounting fraud may deceive its auditor. Regulators in most countries require publicly traded firms to obtain independent audits of their financial statements. Auditors may issue a qualified opinion noting certain aspects of financial statements that are inconsistent with accounting principles or an adverse opinion if they find that financial statements are materially misstated and do not conform with GAAP. (LOS 36.e)

7. **A** IFRS require a firm that presents a nonstandard financial measure to reconcile that measure to an IFRS measure and explain why the firm believes the nonstandard measure is relevant to users of the financial statements. Presenting the nonstandard measure for prior periods is not a requirement. (LOS 36.f)

Module Quiz 36.2, 36.3

1. **C** Management may make inappropriate capitalization decisions to understate expenses by creating balance sheet assets for items that should instead be recognized as expenses in the current period, increasing net income in the current period. Revenues and liabilities are unlikely to be affected by capitalization decisions. (Module 36.2, LOS 36.g)

2. **B** Channel stuffing, which includes activities such as accelerating deliveries to distributors or sending customers unordered merchandise, would likely increase accounts receivable as a percentage of revenues. This would decrease the receivables turnover ratio and increase days of sales outstanding. Payables would not be affected. (Module 36.3, LOS 36.h)

READING 37

FINANCIAL ANALYSIS TECHNIQUES

INTRODUCTION

This reading presents a "tool box" for an analyst. It would be nice if you can calculate all these ratios, but it is imperative that you understand what firm characteristic each one is measuring—and even more important that you know whether a higher or lower ratio is better in each instance.

Different analysts calculate some ratios differently. It would be helpful if analysts were always careful to distinguish between total liabilities, total interest-bearing debt, long-term debt, and creditor and trade debt, but they do not. Some analysts routinely add deferred tax liabilities to debt or exclude goodwill when calculating assets and equity; others do not. Statistical reporting services almost always disclose how each of the ratios they present was calculated. So do not get too tied up in the details of each ratio, but understand what each one represents and what factors would likely lead to significant changes in a particular ratio.

The DuPont formulas have been with us for a long time and were in the curriculum way back in the 1980s. Decomposing ROE into its components is an important analytic technique, and it should definitely be in your tool box.

MODULE 37.1: INTRODUCTION TO FINANCIAL RATIOS

Video covering this content is available online.

LOS 37.a: Describe tools and techniques used in financial analysis, including their uses and limitations.

In the first FSA reading, we were introduced to the six steps of the financial statement analysis framework. We now return to look in more detail at Step 3, which is to "Make any appropriate adjustments to the financial statements. Calculate ratios and perform statistical analysis. Prepare exhibits such as graphs and common-size balance sheets."

The journey we have taken through the accounting principles, with the focus on areas subject to choice, estimation, and subjectivity, enables us to adjust the financial statements in line with the objectives of our analysis. We can now move on to the calculation of ratios.

Analysts use various tools and techniques to convert financial statement data into formats that facilitate analysis. These include ratio analysis, common-size analysis,

graphical analysis, and regression analysis.

Ratio Analysis

Ratios are useful tools for expressing relationships among data that can be used for internal comparisons and comparisons across firms. They are often most useful in identifying questions that need to be answered, rather than answering questions directly. Specifically, ratios can be used to do the following:

- Project future earnings and cash flow.
- Evaluate a firm's flexibility (its ability to grow and meet obligations even when unexpected circumstances arise).
- Assess management's performance.
- Evaluate changes in the firm and industry over time.
- Compare the firm with industry competitors.

Analysts must also be aware of the limitations of ratios, including the following:

- Financial ratios are not useful when viewed in isolation. They are only informative when compared to those of other firms, or to the company's historical performance.
- Comparisons with other companies are made more difficult by different accounting treatments. This is particularly important when comparing U.S. firms to non-U.S. firms.
- It is difficult to find comparable industry ratios when analyzing companies that operate in multiple industries.
- Conclusions cannot be made by calculating a single ratio. All ratios must be viewed relative to one another.
- Determining the target or comparison value for a ratio is difficult, requiring some range of acceptable values.

Ratios must be evaluated in the context of prior period results, the company's stated strategy, analyst expectations, the current position in the business cycle, and against other firms in the industry.

Definitions of ratios can vary widely among the analytical community. For example, some analysts use all liabilities when measuring leverage, while other analysts only use interest-bearing obligations. The important thing is for each individual analyst to use ratios consistently. Analysts must also understand that reasonable values of ratios can differ among industries.

Common-Size Analysis

Common-size statements normalize balance sheets and income statements and allow the analyst to more easily compare performance across firms, and for a single firm over time:

- A **vertical common-size balance sheet** expresses all balance sheet accounts as a percentage of total assets.

$$\text{vertical common-size balance sheet ratios} = \frac{\text{balance sheet account}}{\text{total assets}}$$

- A **vertical common-size income statement** expresses all income statement items as a percentage of sales.

$$\text{vertical common-size income statement ratios} = \frac{\text{income statement account}}{\text{sales}}$$

In addition to comparisons of financial data across firms and time, common-size analysis is appropriate for quickly viewing certain financial ratios. For example, the gross profit margin, operating profit margin, and net profit margin are all clearly indicated within a common-size income statement. Vertical common-size income statement ratios are especially useful for studying trends in costs and profit margins.

The sample common-size statements in Figure 37.1 show balance sheet items as percentages of assets, and income statement items as percentages of sales.

Figure 37.1: Vertical Common-Size Balance Sheet and Income Statement

Balance Sheet, Fiscal Year-End	20X6	20X5	20X4
Assets			
Cash & cash equivalents	0.38%	0.29%	0.37%
Accounts receivable	5.46%	5.61%	6.20%
Inventories	5.92%	5.42%	5.84%
Deferred income taxes	0.89%	0.84%	0.97%
Other current assets	0.41%	0.40%	0.36%
Total current assets	13.06%	12.56%	13.74%
Gross fixed assets	25.31%	23.79%	25.05%
Accumulated depreciation	8.57%	7.46%	6.98%
Net gross fixed assets	16.74%	16.32%	18.06%
Other long-term assets	70.20%	71.12%	68.20%
Total assets	100.00%	100.00%	100.00%
Liabilities			
Accounts payable	3.40%	3.40%	3.79%
Short-term debt	1.00%	2.19%	1.65%
Other current liabilities	8.16%	10.32%	9.14%
Total current liabilities	12.56%	15.91%	14.58%
Long-term debt	18.24%	14.58%	5.18%
Other long-term liabilities	23.96%	27.44%	53.27%
Total liabilities	54.76%	57.92%	73.02%
Preferred equity	0.00%	0.00%	0.00%
Common equity	45.24%	42.08%	26.98%
Total liabilities & equity	100.00%	100.00%	100.00%
Income Statement, fiscal year	**20X6**	**20X5**	**20X4**
Revenues	100.00%	100.00%	100.00%
Cost of goods sold	59.62%	60.09%	60.90%
Gross profit	40.38%	39.91%	39.10%
Selling, general & administrative	16.82%	17.34%	17.84%
Depreciation	2.39%	2.33%	2.18%
Amortization	0.02%	3.29%	2.33%
Other operating expenses	0.58%	0.25%	–0.75%
Operating income	20.57%	16.71%	17.50%
Interest and other debt expense	2.85%	4.92%	2.60%
Income before taxes	17.72%	11.79%	14.90%
Provision for income taxes	6.30%	5.35%	6.17%
Net income	11.42%	6.44%	8.73%

Even a cursory inspection of the income statement in Figure 37.1 can be quite instructive. Beginning at the bottom, we can see that the profitability of the company has increased nicely in 20X6 after falling slightly in 20X5. We can examine the 20X6 income statement values to find the source of this greatly improved profitability. The