Module 6

Inventories, Accounts Payable, and Long-Term Assets

Learning Objectives

LO1 Apply inventory costing methods. (p. 6-3)

LO2 Examine inventory disclosures in financial statements. (p. 6-8)

LO3 Analyze inventories and the related accounts payable. (p. 6-11)

LO4 Apply capitalization and depreciation of tangible assets. (p. 6-16)

LO5 Evaluate asset sales, impairments, and restructuring activities. (p. 6-20)

LO6 Analyze tangible assets and related activities. (p. 6-25)

HD
Market cap: $167,120 mil
Total assets: $42,549 mil
Revenues: $88,519 mil
Net income: $7,009 mil

Home Depot is the world's largest home improvement retailer, selling an assortment of building materials, home improvement products, and lawn and garden products. Two things stand out when you enter a Home Depot store: its size and its large inventories for sale.

Home Depot stores average 104,000 square feet of enclosed space, with 24,000 additional square feet of outside garden area. The company stocks up to 40,000 different kinds of building materials, home improvement supplies, appliances, and lawn and garden products. Two accounts on its balance sheet, Inventories and Property, Plant and Equipment (PPE), make up 80% of total assets.

Inventories are a major asset for many companies (28% of total assets for Home Depot). Having enough inventories for sale is important, but inventories are costly to hold. Companies typically finance the cost of buying or manufacturing goods. Finished inventories are stored, moved, and insured. Consequently, companies prefer to hold fewer inventories when possible. If companies reduce inventories too much, they risk stock-outs—meaning there is not enough inventory to meet demand. Home Depot says it aims to "reduce our average lead time from supplier to shelf, reduce transportation expenses and improve inventory turns."

Companies often purchase inventories on credit—meaning they do not pay their suppliers when goods are shipped. Instead, the company reports accounts payable, on its balance sheet, reflecting the amount that they will pay to suppliers. Accounts payable are a source of free financing for buyers because accounts payable are usually non-interest bearing. Managing accounts payable is an important task.

Property, plant and equipment (or *tangible assets* or PPE, which we use interchangeably) are often the largest assets on a company's balance sheet—52% of total assets for Home Depot. Its land and buildings are made up of 2,274 stores, of which 90% are owned and the remainder are leased. Most companies need offices, technology and R&D facilities, service centers, manufacturing and distribution facilities, vehicles, land, and a host of other assets. These are large investments and once acquired, property, plant and equipment must be maintained and monitored. Their purchase is a critical decision that usually involves a review of the entire value chain.

Managing inventory and PPE is crucial to creating shareholder value. Those actions affect the balance sheet and the income statement—the latter via cost of goods sold (inventory), depreciation, and gains or losses when PPE assets are sold or impaired. In this module, we explain the measurement and reporting of inventory and PPE. We also describe analysis tools to assess the efficiency and effectiveness of inventory and PPE. [Sources: *Home Depot website and its 2015 10-K*]

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Road Map

LO	Learning Objective | Topics	Page	eLecture	Guided Example	Assignments
6-1	**Apply inventory costing methods.** Cost Flows :: FIFO :: LIFO :: AC :: Financial Effects	6-3	e6-1	Review 6-1	1, 2, 3, 4, 10, 13, 14, 23, 25, 42
6-2	**Examine inventory disclosures in financial statements.** LCM :: LIFO Liquidation :: LIFO Reserve and Adjustments	6-8	e6-2	Review 6-2	5, 11, 22, 24, 26, 36
6-3	**Analyze inventories and the related accounts payable.** Gross Profit Margin :: Days Inventory Outstanding :: Inventory Turnover :: Days Payable Outstanding :: Cash Conversion Cycle	6-11	e6-3	Review 6-3	6, 15, 19, 20, 32, 35, 36, 40, 42, 43
6-4	**Apply capitalization and depreciation of tangible assets.** Property :: Plant & Equipment :: Depreciation Methods :: R&D Facilities & Equipment	6-16	e6-4	Review 6-4	7, 8, 16, 17, 27, 28, 29, 30, 33
6-5	**Evaluate asset sales, impairments, and restructuring activities.** Asset Sales :: Gains and Losses :: Asset Impairments	6-20	e6-5	Review 6-5	7, 9, 12, 21, 28, 30, 33, 38, 39, 41
6-6	**Analyze tangible assets and related activities.** PPE Turnover :: PPE Useful Life :: PPE Percent Used Up	6-25	e6-6	Review 6-6	18, 31, 32, 34, 35, 37, 38, 41, 42, 43

Module Organization

Inventories, Accounts Payable, and Long-Term Assets

Organization

Inventories, Accounts Payable, and Long-Term Assets

Inventories and Accounts Payable	Property, Plant & Equipment
■ Inventory Costing Methods ■ Footnote Disclosures ■ Effects of Inventory Costing ■ Inventory Disclosures ■ Inventory Analysis ■ Cash Conversion Cycle	■ Depreciation and Book Value ■ Disposals, Impairments and Restructuring ■ Footnote Disclosures ■ Analysis Tools—Turnover, Useful Life, and Percent Used Up

Inventory—Costing Methods

eLectures MBC **LO1** Apply inventory costing methods.

For many companies, inventory is among the four largest assets on the balance sheet (along with receivables, property, plant & equipments (PPE), and intangible assets such as goodwill). On the income statement, cost of goods sold (which is directly related to inventory), is the largest expense for many companies and certainly for those in retailing and manufacturing. Companies can choose from among several methods to account for inventory costs and these accounting choices can greatly impact the balance sheet and income statement.

When inventory is purchased or produced, it is "capitalized." That is, it is carried on the balance sheet as an asset until it is sold, at which time its cost is transferred from the balance sheet to the income statement as an expense (cost of goods sold). The process by which costs are removed from the balance sheet when the inventory is sold is important. For example, if higher cost units are transferred from the balance sheet, then cost of goods sold is higher and gross profit (sales less cost of goods sold) is lower. Conversely, if lower cost units are transferred to cost of goods sold, gross profit is higher. The remainder of this section discusses the accounting for inventory including the mechanics, reporting, and analysis of inventory costing.

Capitalization of Inventory Cost

Capitalization means that a cost is recorded on the balance sheet and is not immediately expensed in the income statement. Once costs are capitalized, they remain on the balance sheet as assets until they are used up, at which time they are transferred from the balance sheet to the income statement as expense. If costs are capitalized rather than expensed, then assets, current income, and current equity are all higher.

For purchased inventories (such as merchandise), the amount capitalized is the purchase price. For manufacturers, cost capitalization is more difficult, as **manufacturing costs** consist of three components: cost of direct (raw) materials used in the product, cost of direct labor to manufacture the product, and manufacturing overhead. Direct materials cost is relatively easy to compute. Design specifications list the components of each product, and their purchase costs are readily determined. The direct labor cost per unit of inventory is based on how long each unit takes to construct and the rates for each labor class working on that product. Overhead costs are also capitalized into inventory, and include the costs of depreciation, utilities, supervisory personnel, and other costs that contribute to manufacturing activities—that is, all costs of manufacturing other than direct materials and direct labor.

When inventories are sold, their costs are transferred from the balance sheet to the income statement as cost of goods sold (COGS). COGS is then deducted from sales to yield **gross profit**.

Sales
− Cost of goods sold
= Gross profit

The manner in which inventory costs are transferred from the balance sheet to the income statement

The manner in which inventory costs are transferred from the balance sheet to the income statement affects both the level of inventories reported on the balance sheet and the amount of gross profit (and net income) reported on the income statement.

Inventory Cost Flows

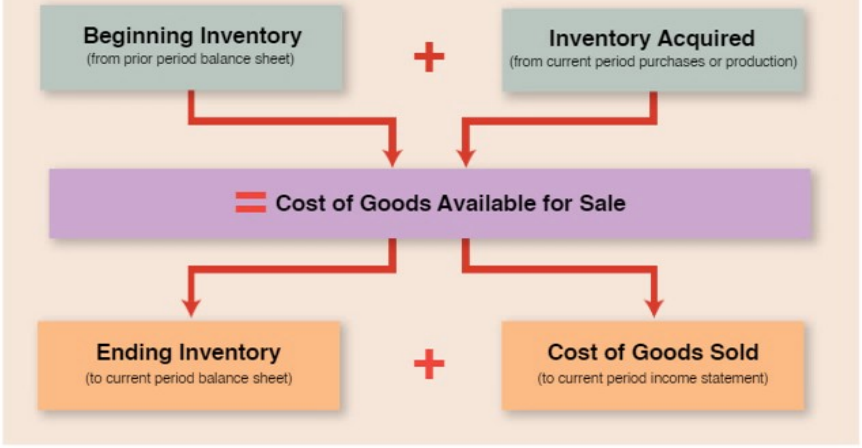
Exhibit 6.1 shows the computation of cost of goods sold.

Exhibit 6.1 ■ Cost of Goods Sold Computation

	Beginning inventory (prior period balance sheet)
+	Inventory purchased and/or produced
	Cost of goods available for sale
−	Ending inventory (current period balance sheet)
	Cost of goods sold (current period income statement)

The cost of inventory available at the beginning of a period is a carryover from the ending inventory balance of the prior period. Current period inventory purchases (or costs of newly manufactured inventories) are added to the beginning inventory balance, yielding the total cost of goods (inventory) available for sale. Then, the goods available are either sold, and end up in cost of goods sold for the period (reported on the income statement), or the goods available remain unsold and are still in inventory at the end of the period (reported on the balance sheet). Exhibit 6.2 shows this cost flow graphically.

Exhibit 6.2 ■ Inventory Cost Flows to Financial Statements



Understanding the flow of inventory costs is important. If all inventory purchased or manufactured during the period is sold, then COGS is equal to the cost of the goods purchased or manufactured. However, when inventory remains at the end of a period, companies must distinguish the cost of the inventories that were sold (cost of goods sold in the income statement) from the cost of the inventories that remain as an asset on the balance sheet.

Exhibit 6.3 illustrates the partial inventory records of a company.

Exhibit 6.3 ■ Summary Inventory Records

Inventory available on January 1, 2017	500 units	@ $100 per unit	$□50,000
Inventory purchased in 2017	200 units	@ $150 per unit	30,000
Total cost of goods available for sale in 2017	700 units		$□80,000
Inventory sold in 2017	450 units	@ $250 per unit	$112,500

This company began the period with 500 units of inventory that were purchased or manufactured for

This company began the period with 500 units of inventory that were purchased or manufactured for $50,000 ($100 each). During the period the company purchased and/or manufactured an additional 200 units costing $30,000. The total cost of goods available for sale for this period equals $80,000.

The company sold 450 units during 2017 for $250 per unit for total sales of $112,500. Accordingly, the company must remove the cost of the 450 units sold from the inventory account on the balance sheet and match this cost against the revenues generated from the sale. An important question is which costs should management remove from the balance sheet and report as cost of goods sold in the income statement? Three inventory costing methods (FIFO, LIFO and average cost) are common and all are acceptable.

First-In, First-Out (FIFO)

The FIFO inventory costing method transfers costs from inventory in the order that they were initially recorded. That is, FIFO assumes that the first costs recorded in inventory (first-in) are the first costs transferred from inventory (first-out). Applying FIFO to the data in Exhibit 6.3 means that the costs of the 450 units sold comes from *beginning* inventory, which consists of 500 units costing $100 each. The company's cost of goods sold and gross profit, using FIFO, is computed as follows.

Sales	$112,500
COGS (450 @ $100 each)	45,000
Gross profit	$67,500

The cost remaining in inventory and reported on the year-end balance sheet is $35,000 ($80,000 goods available for sale less $45,000 COGS). The following financial statement effects template captures the transaction.

COGS . 45,000
INV 45,000

COGS	
45,000	

INV	
	45,000

	Balance Sheet					Income Statement		
Transaction	Cash Asset +	Noncash Assets =	Liabilities +	Contrib. Capital +	Earned Capital	Revenues −	Expenses =	Net Income
Sold 450 units using FIFO (450 @ $100 each)		−45,000 Inventory =			−45,000 Retained Earnings		+45,000 Cost of Goods Sold =	−45,000

Last-In, First-Out (LIFO)

The LIFO inventory costing method transfers the most recent inventory costs from the balance sheet to COGS. That is, the LIFO method assumes that the most recent inventory purchases (last-in) are the first costs transferred from inventory (first-out). The company's cost of goods sold and gross profit, using LIFO, is computed as follows.

Sales		$112,500
COGS: 200 @ $150 per unit	$30,000	
250 @ $100 per unit	25,000	55,000
Gross profit		$57,500

The cost remaining in inventory and reported on the year-end balance sheet is $25,000 (computed as $80,000 − $55,000). This is reflected in our financial statements effects template as follows.

COGS . 55,000
INV 55,000

COGS	
55,000	

INV	
	55,000

	Balance Sheet					Income Statement		
Transaction	Cash Asset +	Noncash Assets =	Liabilities +	Contrib. Capital +	Earned Capital	Revenues −	Expenses =	Net Income
Sold 450 units using LIFO (200 @ $150) + (250 @ $100)		−55,000 Inventory =			−55,000 Retained Earnings		+55,000 Cost of Goods Sold =	−55,000

Average Cost (AC)

The average cost method computes the cost of goods sold as an average of the cost to purchase or manufacture all of the inventories that were available for sale during the period. To calculate the average cost of $114.286 per unit the company divides the total cost of goods available for sale by the number of units available for sale ($80,000/700 units). The company's sales, cost of sales, and gross profit follow.

Sales	$112,500
COGS (450 @ $114.286 per unit)	51,429
Gross profit	$ 61,071

The cost remaining in inventory and reported on the year-end balance sheet is $28,571 ($80,000 − $51,429). This is reflected in our financial statements effects template as follows.

	Balance Sheet					Income Statement			
Transaction	Cash Asset	+ Noncash Assets	= Liabilities	+ Contrib. Capital	+ Earned Capital	Revenues	− Expenses	= Net Income	
Sold 450 units using average cost (450 @ $114.286)		−51,429 Inventory	=		−51,429 Retained Earnings		+51,429 − Cost of Goods Sold	= −51,429	

COGS . . 51,429
INV 51,429

COGS	
51,429	

	INV
	51,429

It is important to understand that the inventory costing method a company chooses to prepare its income statement is independent of the actual flow of inventory. For example, many grocery chains use LIFO inventory but certainly do not sell the freshest products first. (Companies can adopt a new inventory costing method if doing so enhances the quality of the company's financial reports, but changes in inventory costing methods are rare.)

Business Insight ■ Retail Method for Inventory Costing

Retailers such as Home Depot and Lowe's, commonly estimate the cost of ending inventories using the *retail inventory method* (RIM). Retailers know the **cost** of the inventories purchased as well as their **retail** selling price. From this, the retailer computes the **cost-to-retail percentage** and applies that percentage to estimate the cost of the inventory still available at year-end (the ending inventory) as follows.

	Purchase Cost	Retail Selling Price
Beginning inventories	$100,000	$160,000
+ Purchases during the period	300,000	500,000
= Cost of goods available for sale	400,000	660,000
(Cost-to-retail percentage: $400,000/$660,000 = 60.6%)		
Sales		(420,000)
Estimated ending inventory at retail selling prices		$240,000
Estimated ending inventory at cost (60.6% × $240,000 retail)	(145,440)	
= Cost of goods sold	$254,560	

This retailer reports inventory of $145,440 on its balance sheet at year-end. The income statement reports sales of $420,000, cost of goods sold of $254,560, and gross profit of $165,440.

This method allows retailers to readily compute ending inventories at retail selling prices (Quantities available × Selling price). The company's inventory system tracks both the purchase cost and the retail selling price of inventories. These are inputs in the cost-to-retail percentage calculation. The cost-to-retail percentage is important and managers review the ratio regularly for reliability. **Home Depot** describes its inventory costing method as follows.

continued

continued from previous page

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> The majority of the Company's Merchandise Inventories are stated at the lower of cost (first-in, first-out) or market, as determined by the retail inventory method . . . Independent physical inventory counts . . . are taken on a regular basis in each store and distribution center to ensure that amounts reflected in the accompanying Consolidated Financial Statements for Merchandise Inventories are properly stated.

Financial Statement Effects of Inventory Costing

This section describes the financial statement effects of different inventory costing methods.

Income Statement Effects

The three inventory costing methods yield differing levels of gross profit as Exhibit 6.4 shows.

Exhibit 6.4 ■ Income Effects from Inventory Costing Methods

	Sales	Cost of Goods Sold	Gross Profit
FIFO	$112,500	$45,000	$67,500
LIFO	112,500	55,000	57,500
Average cost	112,500	51,429	61,071

Recall that inventory costs *rose* during this period from $100 per unit to $150 per unit. The higher gross profit reported under FIFO arises because FIFO matches older, lower-cost inventory against current selling prices. To generalize: in an inflationary environment, FIFO yields higher gross profit than do LIFO or average cost methods.

In recent years, the gross profit impact from using the FIFO method has been minimal for companies due to lower rates of inflation and increased management focus on reducing inventory quantities through improved manufacturing processes and better inventory controls. The FIFO gross profit effect can still arise, however, with companies subject to high inflation and slow inventory turnover.

Balance Sheet Effects

In our illustration above, the ending inventory using LIFO is less than that reported using FIFO. In periods of rising costs, LIFO inventories are markedly lower than under FIFO. As a result, balance sheets using LIFO do not accurately represent the cost that a company would incur to replace its current investment in inventories.

Caterpillar Inc. (CAT), for example, reports 2015 inventories under LIFO costing $9,700 million. As disclosed in the footnotes to its 10-K, if CAT valued these inventories using FIFO, the reported amount would be $12,298 million, which is $2,498 million greater, a 26% increase (see below). This suggests that CAT's balance sheet omits over $2,498 million in inventories.

> Inventories are stated at the lower of cost or market. Cost is principally determined using the last-in, first-out (LIFO) method. The value of inventories on the LIFO basis represented about 60 percent of total inventories at December 31, 2015 and 2014. If the FIFO (first-in, first-out) method had been in use, inventories would have been $2,498 million and $2,430 million higher than reported at December 31, 2015 and 2014, respectively.

Cash Flow Effects

Unlike most other accounting method choices, inventory costing methods affect taxable income and, thus, taxes paid. When a company adopts LIFO in its tax filings (it must, then, also use LIFO to report to shareholders), in an inflationary economy, pretax profit is lower and so are taxes paid. The tax savings increases operating cash flow (see our 'LIFO Reserve Adjustments to Financial Statements' section that follows). Conversely, in an inflationary economy, using FIFO results in higher taxable income and, consequently, higher taxes payable.

LO1 **Review 6-1**

LO1 **Review 6-1**

At the beginning of the current period, assume that one of **Home Depot**'s subsidiary companies holds 1,000 units of a certain product with a unit cost of $18. A summary of purchases during the current period follows.

		Units	Unit Cost	Cost
Beginning Inventory		1,000	$18.00	$18,000
Purchases:	#1	1,800	18.25	32,850
	#2	800	18.50	14,800
	#3	1,200	19.00	22,800
Cost of goods available for sale		4,800		$88,450

During the current period, the HD subsidiary sells 2,800 units.

Required

1. Assume that the HD subsidiary uses the first-in, first-out (FIFO) method for this product. Compute the product's cost of goods sold for the current period and the ending inventory balance.
2. Assume that the HD subsidiary uses the last-in, first-out (LIFO) method for this product. Compute the product's cost of goods sold for the current period and the ending inventory balance.
3. Assume that the HD subsidiary uses the average cost (AC) method for this product. Compute the product's cost of goods sold for the current period and the ending inventory balance.
4. As manager, which of these three inventory costing methods would you choose:
   a. To reflect what is probably the physical flow of goods? Explain.
   b. To minimize income taxes for the period? Explain.

Solution on p. 6-42.

Inventory—Reporting

Lower of Cost or Market (LCM)

LO2 Examine inventory disclosures in financial statements.

Footnotes to financial statements describe the inventory accounting method a company uses. To illustrate, **Home Depot** reports $11,809 million in inventory on its 2015 balance sheet as a current asset. Following is an excerpt from Home Depot's footnote.

> **Merchandise Inventories** Our Merchandise Inventories are stated at the lower of cost (first-in, first-out) or market, with approximately 71% valued under the retail inventory method and the remainder under a cost method. Retailers like us, with many different types of merchandise at low unit cost and a large number of transactions, frequently use the retail inventory method. Under the retail inventory method, Merchandise Inventories are stated at cost, which is determined by applying a cost-to-retail ratio to the ending retail value of inventories. As our inventory retail value is adjusted regularly to reflect market conditions, our inventory valued using the retail method approximates the lower of cost or market.

Like many retailers, Home Depot uses FIFO to cost its inventory along with the retail inventory method that we explained above. Then, at the end of each accounting period, Home Depot compares the ending FIFO inventory balance with the market value of the inventory (its replacement cost). If the market value is less than the FIFO amount, Home Depot "writes down" the inventory to its market value. The result is that the inventory is carried on the balance sheet at whichever amount is lower: the cost of the inventory *or* its market value. This process is called reporting inventories at the **lower of cost or market** and creates the following financial statement effects.

- Inventory book value is written down to current market value (replacement cost), reducing inven

- Inventory book value is written down to current market value (replacement cost), reducing inventory and total assets.
- Inventory write-down is reflected as an expense (part of cost of goods sold) on the income statement, reducing current period gross profit, income, and equity.

To illustrate, assume that a company has inventory on its balance sheet at a cost of $27,000. Management learns that the inventory's replacement cost is $23,000 and writes inventories down to a balance of $23,000. The following financial statement effects template shows the adjustment.

	Balance Sheet						Income Statement			
Transaction	Cash Asset	+ Noncash Assets	= Liabilities	+ Contrib. Capital	+ Earned Capital		Revenues	− Expenses	= Net Income	
Write down inventory from $27,000 to $23,000		−4,000 Inventory	=		−4,000 Retained Earnings			+4,000 − Cost of Goods Sold	=	−4,000

COGS . 4,000
INV 4,000

COGS
4,000
INV
4,000

The inventory write-down (a noncash expense) is reflected in cost of goods sold and reduces gross profit by $4,000. Inventory write-downs are included in cost of goods sold. They are *not* reported in selling, general, and administrative expenses, which is common for other asset write-downs. A common occurrence of inventory write-downs is in connection with restructuring activities.

LIFO Reserve Adjustments to Financial Statements

CAT uses LIFO for most of its inventories.[1] Had CAT used FIFO, its 2015 balance sheet would have reported inventories of $12,198 million ($9,700 million + $2,498 million) rather than $9,700 million. This difference, referred to as the **LIFO reserve**, is the amount that must be added to LIFO inventories (from the balance sheet) to adjust them to their FIFO value.

FIFO Inventory = LIFO Inventory + LIFO Reserve

By choosing LIFO, CAT's 2015 balance sheet reported inventories that were $2,498 million lower than had the company used FIFO. Because inventory on the balance sheet affects cost of goods sold (COGS) on the income statement, the LIFO choice had a very important effect on CAT's income statements over the years.[2] CAT's *cumulative* COGS was $2,498 million higher than it would have been had the company used FIFO. (Cumulative here means the aggregate amount over the company's entire history.) This cumulative increase in COGS caused a cumulative decrease in gross profit and pretax profit of the same amount, $2,498 million. Because CAT also uses LIFO for tax purposes, lower pretax profits translated into a lower cumulative tax bill by about $874 million ($2,498 million × 35% assumed corporate tax rate). This had real cash flow consequences: CAT's cumulative operating cash flow was $874 million higher because the company chose LIFO instead of FIFO. The cash savings from lower taxes is often cited as a compelling reason for companies to adopt LIFO.

Disclosures for a LIFO Reserve Because companies can choose among the various inventory costing methods, their financial statements are often not comparable. The problem is most serious when companies hold large amounts of inventory and when prices markedly rise or fall. For example, consider comparing CAT to **Kubota**, a close competitor that uses the FIFO method to cost its inventory. The table below reports certain financial information for both companies for fiscal 2015.

[1] Neither the IRS nor GAAP requires use of a single inventory costing method. That is, companies are allowed to, and frequently do, use different inventory costing methods for different types of inventory (such as spare parts versus finished goods) or inventory in different geographical locations.

[2] Recall: Cost of Goods Sold = Beginning Inventories + Purchases − Ending Inventories. Thus, as ending inventories decrease, cost of goods sold increases.

(Monetary amounts in millions)	CAT LIFO as reported	CAT FIFO as restated	Kubota as reported
Inventory	$□9,700	$12,198	¥□ 338,033
LIFO reserve, 2015	$□2,498	—	—
LIFO reserve, 2014	$□2,430	—	—
Total assets	$78,497	$80,995	¥2,476,820
Inventory as a % of total assets	**12%**	**15%**	**14%**
Cost of goods sold	$33,742	$33,674	¥1,104,761
Revenue (equipment sales)	$44,147	$44,147	¥1,586,937
Cost of goods sold as a % of revenue	76.4%	76.3%	69.6%

If we compare the information reported on each company's financial statements ('CAT LIFO as reported' vs. 'Kubota as reported') we would conclude that Caterpillar holds proportionately less inventory than Kubota—12% of total assets for CAT vs. 14% for Kubota. But this is not an apples-to-apples comparison and such a conclusion is erroneous. Fortunately, companies that use LIFO must report their LIFO reserve, and we can use these disclosures to adjust the LIFO numbers to their FIFO equivalents. Once we convert CAT's inventory and its total assets to FIFO (by adding the LIFO reserve, as explained above), we find that the company holds 15% of total assets as inventory, more than Kubota, not less.

Balance Sheet Adjustments for a LIFO Reserve In general, to adjust for LIFO on the balance sheet, we must make three modifications.

- Increase inventories by the LIFO reserve.
- Increase tax liabilities by the tax rate applied to the LIFO reserve.
- Increase retained earnings for the difference.

As an example, to adjust CAT's 2015 balance sheet, we would:

- Increase inventories by $2,498 million.
- Increase tax liabilities by $874 million (the extra cumulative taxes CAT would have had to pay under FIFO, computed as $2,498 million × 35%).
- Increase retained earnings by the difference of $1,624 million (computed as $2,498 million − $874 million).

Income Statement Adjustments for a LIFO Reserve To compare the income statements of companies that use LIFO, we must adjust cost of goods sold from LIFO to FIFO. To do this, we use the *change* in the LIFO reserve to determine the FIFO cost of goods sold (COGS) as follows.

FIFO COGS = LIFO COGS − Increase in LIFO Reserve (or + Decrease)

For CAT in 2015, this is: $33,742 million − ($2,498 million − $2,430 million) = $33,674 million.

Had CAT *always used* FIFO, its 2015 COGS would have been $68 million lower (meaning gross profit and pretax income would be $68 million higher), and it would have paid $24 million more in taxes ($68 million × 35% assumed tax rate). This does not make much difference either in dollar or percentage terms for CAT in 2015 because the LIFO reserve increased only slightly during the year. But for other companies, the impact can be great.

LIFO Liquidations

When companies acquire inventory at different costs, they are required to account for each cost level as a separate inventory pool or layer (for example, there are the $100 and $150 units in our Exhibit 6.3 illustration). When companies reduce inventory levels, older inventory costs flow to the income statement. These older LIFO costs are often markedly different from current replacement costs. Assuming an inflationary environment, sales of older pools often yield a boost to gross profit as older, lower costs are matched against current selling prices on the income statement.

The increase in gross profit resulting from a reduction of inventory quantities in the presence of

The increase in gross profit resulting from a reduction of inventory quantities in the presence of rising costs is called **LIFO liquidation**. The effect of LIFO liquidation is evident in the following footnote from **Rite Aid**'s 2016 10-K.

> **Inventory** (in $000s) . . . During fiscal 2016, 2015 and 2014, a reduction in inventories related to working capital initiatives resulted in the liquidation of applicable LIFO inventory quantities carried at lower costs in prior years. This LIFO liquidation resulted in a $60,653, $38,867 and $13,894 cost of revenues decrease, with a corresponding reduction to the adjustment to LIFO for fiscal 2016, fiscal 2015 and fiscal 2014, respectively.

Rite Aid reports that reductions in inventory quantities in 2016 led to the sale (at current selling prices) of inventory that had a low balance sheet value—the inventory was valued using costs from prior years when those costs were much lower. As a result of these inventory reductions, COGS was lower, which increased income by $60,653 thousand in 2016. Fiscal years 2015 and 2014 were similarly affected.

IFRS Insight ■ Inventory Measurement under IFRS

Like GAAP, IFRS measures inventories at the lower of cost or market. The cost of inventory generally is determined using the FIFO (first-in, first-out) or average cost method; use of the LIFO (last-in, first-out) method is prohibited under IFRS.

Review 6-2 LO2

Refer to the information in Review 6-1. Consider each of the following as separate situations.

Required

1. Assume HD reports its inventories using the FIFO cost flow assumption as in #1 in Review 6-1 and that the market value (replacement cost) of the inventories on the financial statement date is $30,000. At what amount is inventories reported on the balance sheet?
2. Assume that the HD subsidiary utilizes the LIFO method and delays purchasing lot #3 until the next period. Compute cost of goods sold under this scenario and discuss how the LIFO liquidation affects profit.
3. Assume that the subsidiary uses LIFO for this product. In that case, the company would compute and report a LIFO reserve. What is the amount of LIFO reserve? How would that reserve affect the subsidiary's tax expense for the current period (as compared to FIFO) assuming a marginal tax rate of 35%?

Solution on p. 6-43.

Inventory—Analysis Tools

LO3 Analyze inventories and the related accounts payable.

This section describes several useful tools for analysis of inventory and related accounts.

Gross Profit Analysis

The **gross profit margin (GPM)** is gross profit divided by sales. This important ratio is closely monitored by management, analysts, and other external financial statement users. Exhibit 6.5 shows the gross profit margin on **Home Depot**'s sales for the past three years.

Exhibit 6.5 ■ Gross Profit Margin for Home Depot

$ millions	2016	2015	2014
Net sales	$88,519	$83,176	$78,812
Cost of sales	58,254	54,787	51,897
Gross profit	$30,265	$28,389	$26,915
Gross profit margin	34.2%	34.1%	34.2%

The gross profit margin is commonly used instead of the dollar amount of gross profit as the GPM

The gross profit margin is commonly used instead of the dollar amount of gross profit as the GPM allows for comparisons across companies and over time. A decline in GPM is usually cause for concern since it indicates that the company has less ability to pass on increased product cost to customers or that the company is not effectively managing product costs. Some possible reasons for a GPM decline follow.

- *Product line is stale*. Perhaps products are out of fashion and the company must resort to markdowns to reduce overstocked inventories. Or, perhaps the product lines have lost their technological edge, yielding reduced demand.
- *New competitors enter the market*. Perhaps substitute products are now available from competitors, yielding increased pressure to reduce selling prices.
- *General decline in economic activity*. Perhaps an economic downturn reduces product demand and places downward pressure on selling prices.
- *Inventory is overstocked*. Perhaps the company overproduced goods and finds itself in an overstock position. This can require reduced selling prices to move inventory.
- *Manufacturing costs have increased*. This could be due to poor planning, production glitches, or unfavorable supply chain reconfiguration.
- *Changes in product mix*. Perhaps the company is selling a higher proportion of low margin goods.

Home Depot's gross profit margin on product sales increased by 0.1 percentage point (34.1% to 34.2%) over the past year. Following is Home Depot's discussion of its gross profit from its 2015 10-K.

> Gross Profit increased 6.6% to $30.3 billion for fiscal 2015 from $28.4 billion for fiscal 2014. Gross Profit as a percent of Net Sales, or gross profit margin, was 34.2% for fiscal 2015 compared to 34.1% for fiscal 2014, an increase of 6 basis points. The increase in gross profit margin for fiscal 2015 reflects benefits from our supply chain driven by lower fuel costs and increased productivity, partially offset by a change in the mix of products sold and the impact of Interline, which has a lower gross profit margin.

Home Depot's gross profit margin increased in 2015 because of lower fuel costs (inbound logistics are included in the cost of inventory) and increased productivity, partially offset by a change in product mix due to a company named **Interline** that Home Depot acquired in 2015. There are a number of factors that can adversely affect gross profit margins: changes in product mix, new products introduced at low prices to gain market share, increases in production costs, sales discounts, inventory obsolescence, warranty costs, and changes in production volume (higher production volume spreads out manufacturing overhead over a greater number of units produced, thus lowering the cost per unit produced).

Competitive pressures mean that companies rarely have the opportunity to completely control gross profit with price increases. Improvements in gross profit on existing product lines typically arise from better management of supply chains, production processes, or distribution networks. Companies that succeed do so because of better performance on basic business processes.

Days Inventory Outstanding and Inventory Turnover

A powerful way to analyze inventory is to compare the income statement activity related to inventory (COGS) to inventory levels on the balance sheet. This helps us assess inventory management and provides insight into the company's efficiency in generating sales. We calculate the number of days required to sell all of the inventory held (on average).

Average days inventory outstanding (DIO), also called *days inventory outstanding*, is computed as follows.

$$\text{Average Days Inventory Outstanding} = 365 \times \text{Average Inventory} / \text{COGS}$$

Cost of goods sold is in the denominator (instead of sales) because inventory is reported at cost

Cost of goods sold is in the denominator (instead of sales) because inventory is reported at cost whereas sales includes any gross profit on the inventory. We calculate average inventory as a simple average of the balance at the beginning and the balance at the end of the period.[3]

For Home Depot ($ millions), average days inventory outstanding in 2015 follows.

$$\text{Average Days Inventory Outstanding} = \frac{365 \times (\$11{,}809 + \$11{,}079)/2}{\$58{,}254} = 71.7 \text{ days}$$

The result implies that it takes Home Depot about 72 days, on average, to sell its average inventory.

Overall, analysis of days inventory outstanding is important for at least two reasons.

1. *Inventory quality.* Days inventory outstanding can be compared over time and across competitors. Fewer days is viewed favorably, because it implies that products are salable, preferably without undue discounting (we would compare profit margins to assess discounting). Conversely, more days implies that inventory is on the shelves for a longer period of time, perhaps from excessive purchases or production, missed fashion trends or technological advances, increased competition, and so forth. Our conclusions about higher or lower days inventory outstanding must consider alternative explanations including the following.
   - Product mix can include more (or less) higher margin inventories that sell more slowly. This can occur from business acquisitions that consolidate different types of inventory.
   - A company can change its promotion policies. Increased, effective advertising is likely to decrease days inventory outstanding. Advertising expense is in SG&A, not COGS. This means the additional advertising cost is in operating expenses, but the benefit is in gross profit and fewer days. If the promotion campaign is successful, the positive effects in margin and days should more than offset the promotion cost in SG&A.
   - A company can realize improvements in manufacturing efficiency and lower investments in direct materials and work-in-process inventories. Such improvements reduce inventory and, consequently, decrease days inventory outstanding. Although a good sign, it does not yield any information about the desirability of a company's product line.
2. *Asset utilization.* Companies strive to optimize their inventory investment. Carrying too much inventory is expensive, and too little inventory risks stock-outs and lost sales (current and future). Companies can make the following operational changes to optimize inventory.
   - Improved manufacturing processes can eliminate bottlenecks and the consequent buildup of work-in-process inventories.
   - Just-in-time (JIT) deliveries from suppliers, which provide raw materials to the production line when needed, can reduce the level of raw materials and associated holding costs.
   - Demand-pull production, in which raw materials are released into the production process when final goods are demanded by customers instead of producing for estimated demand, can reduce inventory levels. **Harley-Davidson**, for example, does not manufacture a motorcycle until it receives the customer's order; thus, Harley produces for actual, rather than estimated, demand.

Reducing inventories reduces inventory carrying costs, thus improving profitability and increasing cash flows. The reduction in inventory is reflected as an operating cash inflow in the statement of cash flows.

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[3] This formula uses average inventories. A variant of the ratio considers the number of days to sell the *ending* inventories (365 × Ending inventories/COGS). For 2016, this ratio is as follows: Days Inventory Outstanding $= \frac{365 \times \$11{,}809}{\$58{,}254} = 74.0$. These two approaches address different issues: the "average days" tells us the number of days it took Home Depot to sell the inventory available for sale during the year. The second approach tells us the number of days it would take Home Depot to sell the current *ending* inventories. It is important that we first identify the issue under investigation and then choose the formula that best addresses that issue.

A similar measure is the **inventory turnover** ratio, which is computed as

Inventory Turnover = Cost of Goods Sold / Average Inventory

For Home Depot ($ millions), the inventory turnover ratio for 2016 is: $\frac{\$58{,}254}{(\$11{,}809 + \$11{,}079)/2} = 5.09$. Home Depot is turning its inventories 5.09 times per year.

There is normal tension between the sales side of a company that argues for depth and breadth

There is normal tension between the sales side of a company that argues for depth and breadth of inventory, and the finance side that monitors inventory carrying costs and seeks to maximize cash flow. Companies, therefore, seek to *optimize* inventory investment, not minimize it.

Days Payable Outstanding

Most companies purchase inventories on credit, meaning that suppliers allow companies to pay later. The supplier sets credit terms that specify when the invoice must be paid. Sometimes the supplier will offer a discount if the company pays more quickly. A typical invoice might include payment terms of 2/10, net 30, which means that the seller offers a 2% discount if the invoice is paid within 10 days and, if not, requires payment in full to be made in 30 days. Business-to-business (B2B) payables are usually non-interest bearing. This means accounts payable represent a low-cost financing source and companies should defer payment as long as allowed by the vendor. The average length of time that payables are deferred is reflected in the **days payable outstanding (DPO)** ratio, computed as:

$$\text{Days payable outstanding} = \frac{365 \times \text{Average Accounts Payable}}{\text{COGS}}$$

Similar to the days inventory outstanding ratio, COGS is in the denominator because payables relate to the purchase of inventories, which are reported at cost. For Home Depot, days payable outstanding for 2016 is:

$$\text{Days payable outstanding} = \frac{365 \times (\$6{,}565 + \$5{,}807)/2}{\$58{,}254} = 38.8 \text{ days}$$

This means Home Depot pays its suppliers in 38.8 days, on average. This is slightly longer than the typical supplier payment terms of 30 days.

Delaying payment to suppliers allows the purchasing company to increase its available cash (in other words, reduce its necessary level of cash). However, excessive delays (called "leaning on the trade") can damage supplier relationships. Remember, the purchaser's days payable outstanding is the seller's days sales outstanding in accounts receivable—this means as the purchaser gains cash from delaying payment, the seller loses an equal amount. As such, if delays become excessive, sellers might increase product cost or even choose to not sell to the purchaser. In managing the days accounts payable outstanding, companies must take care to maximize available cash while minimizing supply-chain disruption.

Cash Conversion Cycle

The cash conversion cycle is defined as:

Days sales outstanding (accounts receivable)
+ Days inventory outstanding
− Days payable outstanding
= Cash conversion cycle

Each time a company completes one cash conversion cycle, it has purchased and sold inventory (realizing sales and gross profit), and paid accounts payable and collected accounts receivable. The cycle increases cash flow (unless the sales are not-profitable). The aim is to minimize the time to complete a cycle.

Home Depot's cash conversion cycle for the 2012–2016 period follows.

Amounts in days	2016	2015	2014	2013	2012
Days sales outstanding	6.96	6.32	6.47	6.45	6.04
+ Days inventory outstanding	71.70	73.74	76.55	78.49	82.88
− Days payable outstanding	(38.76)	(38.65)	(39.29)	(38.18)	(37.87)
= Cash conversion cycle	39.90	41.41	43.73	46.76	51.05

Since 2012, Home Depot has greatly improved its cash conversion cycle from 51 days in 2012 to

Since 2012, Home Depot has greatly improved its cash conversion cycle from 51 days in 2012 to about 40 days in 2016. The biggest improvement was for inventory days, which dropped 11 days over the five-year period (82.88 days minus 71.70 days = 11.2 days). Inventory management has been a strategic focus for Home Depot as explained in its 2016 MD&A.

> Our distribution strategy is to provide the optimal flow path for a given product. Rapid Deployment Centers ("RDCs") play a key role in optimizing our network as they allow for aggregation of product needs for multiple stores to a single purchase order and then rapid allocation and deployment of inventory to individual stores upon arrival at the RDC. This results in a simplified ordering process and improved transportation and inventory management. We have 18 mechanized RDCs in the U.S. and two recently opened mechanized RDCs in Canada. Through Project Sync, which is being rolled out gradually to suppliers in several U.S. RDCs, we can significantly reduce our average lead time from supplier to shelf. Project Sync requires deep collaboration among our suppliers, transportation providers, RDCs and stores, as well as rigorous planning and information technology development to create an engineered flow schedule that shortens and stabilizes lead time, resulting in more predictable and consistent freight flow. As we continue to roll out Project Sync throughout our supply chain over the next several years, we plan to create an end-to-end solution that benefits all participants in our supply chain, from our suppliers to our transportation providers to our RDC and store associates to our customers.
>
> Over the past several years, we have centralized our inventory planning and replenishment function and continuously improved our forecasting and replenishment technology. This has helped us improve our product availability and our inventory productivity at the same time. At the end of fiscal 2015, over 95% of our U.S. store products were ordered through central inventory management.

Supply chain optimization is often cited as a key for effective inventory management. Inventories are recognized on the balance sheet when received at the distribution center and the days inventories outstanding clock starts ticking at that moment. Home Depot's challenge, then, is to minimize the time it takes to get the right amount of product from the distribution center to the store shelves. This involves accurate estimates of customer demand for products and an efficient logistics network.

By reducing the average inventory days by 11.2 days, Home Depot increased its cash balance by $1,787.5 million, computed as (Δ refers to 'change in'):

$$\Delta \text{ Cash} = \Delta \text{ Days Inventory Outstanding} \times (\text{COGS}/365)$$
$$= 11.2 \text{ days} \times (\$58{,}254 \text{ million}/365 \text{ days}) = \$1{,}787.52 \text{ million}$$

Managerial Decision ■ **You Are the Operations Manager**

You are analyzing your inventory turnover report for the month and are concerned that the average days inventory outstanding is lengthening. What actions can you take to reduce average days inventory outstanding? [Answer, p. 6-29]

Review 6-3 LO3

Lowe's Companies Inc. is a competitor of **Home Depot**. It reports the following financial statement data for 2014, 2015 and 2016. Use these data to answer the requirements below.

$ millions	2016	2015	2014
Revenue	$59,074	$56,223	$53,417
Cost of goods sold	38,504	36,665	34,941
Gross profit	20,570	19,558	18,476
Accounts receivable	0	0	0
Inventory	9,458	8,911	9,127
Accounts payable	□5,633	□5,124	□5,008

continued

Required

1. Compute the gross profit margin for 2014, 2015, and 2016.
2. Compute the days inventory outstanding for 2015 and 2016.
3. Compute the days payable outstanding for 2015 and 2016.
4. Compute the cash conversion cycle for 2015 and 2016. By how many days did the cash conversion cycle improve during 2016?
5. Compute the cash savings in 2016 due to the improvement in the cash conversion cycle.

Solution on p. 6-44.

PPE Assets—Capitalization And Depreciation

eLectures MBC **LO4** Apply capitalization and depreciation of tangible assets.

Property, plant and equipment (PPE or PP&E, also called tangible or fixed assets), is the largest asset for most companies, and depreciation is often second in expenses to cost of goods sold on the income statement. Companies choose the method to compute depreciation, which can markedly impact the income statement and balance sheet. When companies dispose of PPE, a gain or loss often results. Understanding gains and losses on asset sales is important as we assess performance. Also, asset write-downs (and impairments) impact companies' current financial performance *and* future profitability. We must understand these accounting effects when we read and analyze and forecast financial statements.

When PPE is acquired, it is recorded at cost on the balance sheet. This is called *capitalization*, which explains why *expenditures* for PPE are called CAPEX. The amount capitalized on the balance sheet includes all costs to put the assets into service. This includes the cost of the PPE as well as transportation, duties, tax, and necessary costs to install and test the assets.

Instead of purchasing PPE outright, companies often enter into long-term equipment leases to increase operational flexibility or to take advantage of attractive financing terms. If the lease terms convey the "risks and rewards" of ownership, the equipment is capitalized just like other tangible assets. These "capital lease" assets are included in the company's PPE even though the company does not legally own the assets. The rationale is that the company operates the assets as if it did own them. For example, Home Depot includes on its 2015 balance sheet capital lease assets of over $1 billion. (We discuss capital leases in detail in a later module.)

Plant and Equipment

Once capitalized, the cost of plant and equipment is recognized as expense over the period of time that the assets produce revenues (directly or indirectly) in a process called depreciation. Depreciation recognizes *using up* of the asset over its useful life. Only assets that have a useful life are depreciated—**land, for example, does not have a determinable useful life and is therefore *not* depreciated**.

To determine depreciation expense, a company makes three estimates.

1. **Useful life**—period of time over which the asset is expected to generate measurable benefits.
2. **Salvage value**—amount expected for the asset when disposed of at the end of its useful life.
3. **Depreciation method**—estimate of how the asset is used up over its useful life.

With these three estimates, the company can determine a depreciation rate that approximates how the asset is used up over its life. The company uses that rate to systematically decrease the asset's balance sheet value (called the carrying value) such that, at the end of its useful life, the asset's carrying value equals its salvage value. When the asset is sold, the difference between the sales proceeds and its book value is recorded as a gain or loss on sale in the income statement.

Companies can use any reasonable method to depreciate assets. Straight-line depreciation is the most common method in the U.S. and around the world. In its footnotes, Home Depot discloses that it uses straight-line depreciation for all of its property, plant and equipment. The declining-balance method is a distant second. We look at these two methods in more detail.

Straight-Line Method

Straight-Line Method

To illustrate, consider a machine with the following details: $100,000 cost, $10,000 salvage value, and a five-year useful life. Under the straight-line (SL) method, depreciation expense is recognized evenly over the estimated useful life of the asset as follows.

Depreciation Base	Depreciation Rate
Cost − Salvage value = $100,000 − $10,000 = $90,000	1/Estimated useful life = 1/5 years = 20%

Depreciation expense per year for this asset is $18,000, computed as $90,000 × 20%. For the asset's first full year of usage, $18,000 of depreciation expense is reported in the income statement. (If an asset is purchased midyear, it is typically depreciated only for the portion of the year it is used. For example, had the asset in this illustration been purchased on May 31, the company would report $10,500 of depreciation in the first year, computed as 7/12 × $18,000, assuming the company has a December 31 year-end.) This depreciation is reflected in the company's financial statements as follows.

DE 18,000
AD 18,000

DE
18,000

AD
18,000

	Balance Sheet						Income Statement			
Transaction	Cash Asset	+ Noncash Assets	= Liabilities	+ Contrib. Capital	+ Earned Capital		Revenues	− Expenses	= Net Income	
Record $18,000 straight-line depreciation		−18,000 Accumulated Depreciation	=		−18,000 Retained Earnings			+18,000 Depreciation Expense	=	−18,000

The accumulated depreciation (contra asset) account increases by $18,000, thus reducing net PPE by the same amount. Also, $18,000 of the asset cost is transferred from the balance sheet to the income statement as depreciation expense. At the end of the first year the asset is reported on the balance sheet as follows.

Machine, at cost	$100,000
Less accumulated depreciation	18,000
Machine, net (end of Year 1).	$□82,000

Net book value →

Accumulated depreciation is the sum of all depreciation expense that has been recorded to date. The asset **net book value (NBV)**, or *carrying value*, is cost less accumulated depreciation. Although the word value is used here, it does not refer to market value. Depreciation is a cost allocation concept (transfer of costs from the balance sheet to the income statement), not a valuation concept.

In the second year of usage, another $18,000 of depreciation expense is recorded in the income statement and the net book value of the asset on the balance sheet follows.

Machine, at cost	$100,000
Less accumulated depreciation	36,000
Machine, net (end of Year 2)	$□64,000

Net book value →

Accumulated depreciation of $36,000 now includes the sum of the first and second years' depreciation, and the net book value of the asset is now reduced to $64,000. After the fifth year, a total of $90,000 of accumulated depreciation will be recorded ($18,000 per year × 5 years), yielding a net book value for the machine of $10,000. The net book value at the end of the machine's useful life is exactly equal to the salvage value that management estimated when the asset was acquired.

Double-Declining-Balance Method

Double-Declining-Balance Method

Accelerated methods of depreciation are used by some companies, the most common being the double-declining-balance method. This method records more depreciation in the early years of an asset's useful life (hence the term *accelerated*) and less depreciation in later years. At the end of the asset's useful life, the balance sheet will still report a net book value equal to the asset's salvage value. The difference between straight-line and accelerated depreciation methods is not in the total amount of depreciation, but in the rate at which costs are transferred from the balance sheet to the income statement.

For the double-declining-balance (DDB) method, the depreciation base is net book value, which declines over the life of the asset (this is why the method is called "declining balance"). The depreciation rate is twice the straight-line (SL) rate (which explains the word "double"). The depreciation base and rate for the asset in our illustrative example are computed as follows.

Depreciation Base	Depreciation Rate
Net Book Value = Cost − Accumulated Depreciation	2 × SL rate = 2 × 20% = 40%

The depreciation expense for the first year is $40,000, computed as $100,000 × 40%. This depreciation is reflected in the company's financial statements as follows.

	Balance Sheet						Income Statement			
Transaction	Cash Asset	+	Noncash Assets	=	Liabilities	+ Contrib. Capital +	Earned Capital	Revenues	− Expenses	= Net Income
Record $40,000 DDB depreciation			−40,000 Accumulated Depreciation	=			−40,000 Retained Earnings		+ 40,000 Depreciation Expense	= −40,000

DE 40,000
AD 40,000

DE	
40,000	

	AD
	40,000

The accumulated depreciation (contra asset) account increases by $40,000 which reduces net PPE (compare this to the $18,000 depreciation under straight-line). This means that $40,000 of the asset cost is transferred from the balance sheet to the income statement as depreciation expense. At the end of the first year, the asset is reported on the balance sheet as follows.

Machine, at cost	$100,000
Less accumulated depreciation	40,000
Machine, net (end of Year 1)	$□60,000

Net book value →

In the second year, the net book value of the asset is the new depreciable base, and the company records depreciation of $24,000 ($60,000 × 40%) in the income statement. At the end of the second year, the net book value of the asset on the balance sheet is:

Machine, at cost	$100,000
Less accumulated depreciation	64,000
Machine, net (end of Year 2)	$□36,000

Net book value →

Under the double-declining-balance method, a company continues to record depreciation expense in this manner until the salvage value is reached, at which point the depreciation process is discontinued. This leaves a net book value equal to the salvage value, as with the straight-line method. (A variant of DDB allows for a change from DDB to SL at the point when SL depreciation exceeds that for DDB.) The DDB depreciation schedule for the life of this asset is in Exhibit 6.6.

Exhibit 6.6 ■ Double-Declining-Balance Depreciation Schedule

Year	Book Value at Beginning of Year	Depreciation Expense	Book Value at End of Year
1	$100,000	$40,000	$60,000
2	60,000	24,000	36,000
3	36,000	14,400	21,600
4	21,600	8,640	12,960
5	12,960	2,960*	10,000

*The formula value of $5,184 ($12,960 × 40%) is *not* reported because it would depreciate the asset below salvage value; only the $2,960 needed to reach salvage value is reported.

Exhibit 6.7 shows the depreciation expense and net book value for both the SL and DDB methods. During the first two years, the DDB method yields a higher depreciation expense compared to the SL method. Beginning in the third year, this pattern reverses and the SL method produces higher depreciation expense. Over the asset's life, the same $90,000 of asset cost is transferred to the income statement as depreciation expense, leaving a salvage value of $10,000 on the balance sheet under both methods.[4]

Companies typically use the SL method for financial reporting purposes and an accelerated depreciation method for tax returns.[5] The reason is that in early years the SL depreciation yields higher income on financial statements, whereas accelerated depreciation yields lower taxable income. Even though this relation reverses in later years, companies prefer to have the tax savings sooner rather than later so that the cash savings can be invested to produce earnings. Further, the reversal may never occur—if depreciable assets are growing at a fast enough rate, the additional first year's depreciation on newly acquired assets more than offsets the lower depreciation expense on older assets, yielding a "permanent" reduction in taxable income and taxes paid.

Exhibit 6.7 ■ Comparison of Straight-Line and Double-Declining-Balance Depreciation

	Straight-Line		Double-Declining-Balance	
Year	Depreciation Expense	Book Value at End of Year	Depreciation Expense	Book Value at End of Year
1	$18,000	$82,000	$40,000	$60,000
2	18,000	64,000	24,000	36,000
3	18,000	46,000	14,400	21,600
4	18,000	28,000	8,640	12,960
5	18,000	10,000	2,960	10,000
	$90,000		$90,000	

All depreciation methods yield the same salvage value

Total depreciation expense over asset life is identical for all methods

Research and Development Facilities and Equipment

In a prior module, we introduce R&D expense and explain that it includes costs associated with property and buildings to be used as research facilities. Importantly, ***R&D facilities and equipment*** are not immediately expensed. If they are *general-use* in nature (such as a general research laboratory that can be used for many types of activities), the costs are capitalized on the balance sheet and depreciated over its useful life like other depreciable assets. Only those R&D facilities and equipment

[4] A third, common depreciation method is **units-of-production**, which depreciates assets according to use. Specifically, the depreciation base is cost less salvage value, and the depreciation rate is the units produced and sold during the year compared with the total expected units to be produced and sold. For example, if a truck is driven 10,000 miles out of a total expected 100,000 miles, 10% of its nonrecoverable cost is reflected as depreciation expense. This method is common for extractive industries like timber and coal.

[5] The IRS mandates the use of MACRS (Modified Accelerated Cost Recovery System) for tax purposes. This method specifies the useful life for various classes of assets, assumes no salvage value, and generally uses the double-declining-balance method. We discuss MACRS and other income tax issues in a later module.

that are purchased specifically for a single R&D project, and have *no alternative use*, are expensed

that are purchased specifically for a single R&D project, and have *no alternative use*, are expensed immediately in the income statement (an unusual situation).

Companies expect R&D efforts ultimately to yield new tangible products and services. This might suggest that *all* R&D costs be capitalized (recognized as assets) on the balance sheet. After all, R&D can create future revenues like other assets including PPE.

However, with the exception of facilities and equipment that have alternative uses, R&D costs are *not* capitalized. Instead, R&D costs are expensed in the income statement as they are incurred. The rationale for this accounting treatment is threefold.

- Whether any tangible projects or services will be developed is often uncertain while the R&D is ongoing. Indeed, many R&D efforts fail to produce any benefits whatsoever.
- Even for R&D programs that look promising, the timing of future products and services is uncertain.
- Salaries for R&D personnel are no different than for other personnel whose salaries and wages are expensed when incurred.

It is generally acknowledged that R&D costs, especially development costs associated with clearly defined products for which a workable prototype has been proven, do create future benefits and have the characteristics of assets. However, the measurement uncertainty argument prevails and R&D costs are not capitalized under GAAP and, with the exception of general-use R&D PPE assets, they are expensed when incurred.

LO4 **Review 6-4**

On January 2, assume that one of **Home Depot**'s subsidiary companies purchases equipment that fabricates a key-product part. The equipment costs $95,000, and its estimated useful life is five years, after which it is expected to be sold for $10,000.

Required

1. Compute depreciation expense for each year of the equipment's useful life for each of the following depreciation methods:
   a. Straight-line
   b. Double-declining-balance
2. Show how the HD subsidiary reports the equipment on its balance sheet at the end of the third year assuming straight-line depreciation.

Solution on p. 6-44.

PPE Assets—Sales, Impairments, and Restructuring

This section discusses gains and losses from asset sales, restructurings, and the computation and disclosure of asset impairments.

LO5 Evaluate asset sales, impairments, and restructuring activities.

Asset Sales

The gain or loss on the sale (disposition) of a tangible asset is computed as follows.

Gain or Loss on Asset Sale = Proceeds from Sale − Net Book Value of Asset Sold

An asset's net book value is its acquisition cost less accumulated depreciation. When an asset is sold, its acquisition cost and related accumulated depreciation are both removed from the balance sheet and any gain or loss is reported in income from continuing operations.

Gains and losses on asset sales can be large, and analysts must be aware that these gains and losses are usually *transitory operating* income components. Financial statements do not typically report gains and losses from tangible asset sales because, if the gain or loss is small (immaterial), companies include the item in selling, general and administrative expenses. Footnotes can sometimes

be informative. To illustrate, **Hilton Worldwide Holdings** provides the following footnote disclosure

be informative. To illustrate, **Hilton Worldwide Holdings** provides the following footnote disclosure relating to the sale of the Waldorf Astoria hotel in New York.

> **Waldorf Astoria New York.** In February 2015, we completed the sale of the Waldorf Astoria New York for a purchase price of $1.95 billion. As a result of the sale, we recognized a gain of $143 million included in gain on sales of assets, net in our consolidated statement of operations for the year ended December 31, 2015.

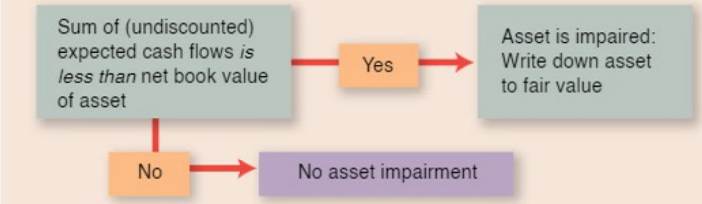
Hilton sold the Waldorf Astoria hotel in New York for $1.95 billion in 2015. If we assume zero tax for simplicity, the hotel was carried on Hilton's balance sheet at a book value of $1.807 billion, where Hilton recognized a gain on sale, net of $143 million ($1.95 billion − $1.807 billion).

Asset Impairments

Tangible assets are reported at their net book values (original cost less accumulated depreciation). This is the case even if the market values of these assets increase subsequent to acquisition. As a result, there can be unrecognized gains hidden within the balance sheet.

On the other hand, if market values of PPE assets subsequently decrease—and the asset value is deemed to be permanently impaired—then, companies must write off the impaired cost and recognize losses on those assets. **Impairment** of PPE assets is determined by comparing the asset's net book value to the sum of the asset's *expected* future (undiscounted) cash flows. If the sum of expected cash flow is greater than net book value, there is no impairment. However, if the sum of the expected cash flow is less than net book value, the asset is deemed impaired and it is written down to its current fair value (generally, the present value of those expected cash flows). Exhibit 6.8 depicts this impairment analysis.

Exhibit 6.8 ■ Impairment Analysis of Tangible Assets



When a company records an impairment charge, assets are reduced by the amount of the write-down and the loss is recognized in the income statement. To illustrate, a footnote to the 2015 10-K of **Chesapeake Energy** reports the following about asset impairments.

> For the year ended December 31, 2015, Chesapeake had a net loss of $14.635 billion, or $22.43 per diluted common share, on total revenues of $12.764 billion. This compares to net income of $2.056 billion, or $1.87 per diluted common share, on total revenues of $23.125 billion for the year ended December 31, 2014. The decrease in net income in 2015 was primarily driven by impairments of our oil and natural gas properties. . . For the year ended December 31, 2015, we reported non-cash impairment charges on our oil and natural gas properties totaling $18.238 billion, primarily resulting from a substantial decrease in the trailing 12-month average first-day-of-the-month oil and natural gas prices throughout 2015, and the impairment of certain undeveloped leasehold interests. The trailing 12-month average first-day-of-the-month prices used to calculate our oil and natural gas reserves decreased from $94.98 per bbl of oil and $4.35 per mcf of natural gas as of December 31, 2014 to $50.28 per bbl of oil and $2.58 per mcf of natural gas as of December 31, 2015.

As oil prices declined in 2015, Chesapeake Energy, like many other oil and gas companies, was forced

As oil prices declined in 2015, Chesapeake Energy, like many other oil and gas companies, was forced to write down its oil and gas properties. This led to an impairment charge of $18,238 million. To determine the impairment charge, Chesapeake compared the fair value of certain properties using the 2015 market prices for oil and gas to the properties' carrying value (the net book value on the balance sheet). Because historical prices had dropped drastically during 2015 (from $94.98 to $50.28, for example), the properties' fair value also dropped drastically.

IFRS Insight ■ PPE Valuation under IFRS

Like GAAP, companies reporting under IFRS must periodically assess long-lived assets for possible impairment. Unlike the two-step GAAP approach, IFRS uses a one-step approach: firms compare an asset's net book value to its current fair value (estimated as discounted expected future cash flows) to test for impairment and then reduce net book value to that fair value. Under IFRS, impairment losses can be reversed if the PPE subsequently regains its value. The PPE account is increased to the newly estimated recoverable amount, not to exceed the assets' initial cost adjusted for depreciation. GAAP prohibits such reversals. Another IFRS difference is that PPE can be revalued upwards to fair value each period, if fair value can be measured reliably.

Restructuring Costs

It is not uncommon for a company to face corporate challenges that are so great that the only way forward is to alter its organizational, operational, and financial structures. Such corporate "restructurings" are designed to turn a company around and are frequently initiated in response to poor performance, mounting debt, and shareholder pressure. A restructuring can involve eliminating business segments, selling major assets, downsizing the workforce, and reconfiguring debt. Ultimately, the goal of a restructuring is to positively impact a company's long-term financial performance. But in the short term, restructurings usually have large negative impacts on the company's income statement.

Disclosure of Restructuring Costs

Because of their magnitude, restructurings require enhanced disclosure either as a separate line item in the income statement or as a footnote. Restructuring costs typically include three components:

1. Employee severance or relocation costs.
2. Asset write-downs.
3. Other restructuring costs.

Reporting of employee severance or relocation costs. The first part, **employee severance or relocation costs**, represents accrued (estimated) costs to terminate or relocate employees as part of a restructuring program. To accrue those expenses, the company must:

- Estimate total costs of terminating or relocating selected employees; these costs might include severance pay (typically a number of weeks of pay based on the employee's tenure with the company), outplacement costs, and relocation or retraining costs for remaining employees.
- Report *total* estimated costs as an expense (and a liability) in the period the restructuring program is announced. Subsequent payments to employees reduce the restructuring accrual (the liability).

Reporting of asset write-downs. The second part of restructuring costs is **asset write-downs**, also called *write-offs* or *charge-offs*. Restructuring activities usually involve closure or relocation of manufacturing or administrative facilities. This can require the write-down of assets whose fair value is less than book value. For example, restructurings can necessitate the write-down of long-term assets (such as plant assets or goodwill) and of inventories. To determine the amount of the write-down, the company follows the approach in Exhibit 6.8. Remember that write-downs have no cash flow effects unless the write-down has tax consequences.

Reporting of other restructuring costs. The third part of restructuring costs is typically labeled "Other" and includes costs of vacating duplicative facilities, fees to terminate contracts (such as lease agreements and service contracts), and other exit costs (such as legal and asset-appraisal fees). Companies estimate and accrue these costs and reduce the restructuring liability as those costs are paid in cash.

For a company to use the term "restructuring" in the income statement and to accrue restructuring

For a company to use the term "restructuring" in the income statement and to accrue restructuring liabilities, the company is required to have a formal restructuring plan that is approved by its board of directors. Also, a company must identify the relevant employees and notify them of its plan. In each subsequent year, the company must disclose in its footnotes the original amount of the Restructuring liability (accrual), how much of that liability is settled in the current period (such as employee payments), how much of the original liability has been reversed because of original cost overestimation, any new accruals for unforeseen costs, and the current balance of the liability. This creates more transparent financial statements, which allow readers to see, in hindsight, if the initial restructuring accrual was overstated (requiring subsequent reversal) or understated (requiring subsequent additions to the restructuring accrual).

Business Insight ■ Pfizer's Restructuring

Pfizer explains its restructuring efforts as follows in its 2015 10-K.

We incur significant costs in connection with acquiring, integrating and restructuring businesses and in connection with our global cost-reduction and productivity initiatives. For example:

- In connection with acquisition activity, we typically incur costs associated with executing the transactions, integrating the acquired operations, and restructuring the combined company; and
- In connection with our cost-reduction and productivity initiatives, we typically incur costs and charges associated with site closings and other facility rationalization actions, workforce reductions and the expansion of shared services, including the development of global systems.

All of our businesses and functions may be impacted by these actions, including sales and marketing, manufacturing and research and development, as well as groups such as information technology, shared services and corporate operations. The following table provides the components of and changes in our restructuring accruals.

$ millions	Employee Termination Costs	Asset Impairment Charges	Exit Costs	Accrual
Balance, January 1, 2014	$1,685	$ —	$ 94	$1,779
Provision	68	45	58	170
Utilization and other.....	(639)	(45)	(100)	(783)
Balance, December 31, 2014	1,114	—	52	1,166
Provision	489	254	68	811
Utilization and other.....	(495)	(254)	(71)	(820)
Balance, December 31, 2015	$1,109	$ —	$ 48	$1,157

The table reflects Pfizer's restructuring transactions for 2014 and 2015. The right-most "Accrual" column shows totals for the year. Disclosure is required of the beginning-year balance of the restructuring liability accrual ($1,166 million for 2015) together with changes in that liability for the year. During 2015, Pfizer added $811 million to the liability and recorded it as restructuring expense in its income statement. (On the income statement, Pfizer aggregated the $811 million with additional costs relating to its acquisitions of Hospira and Allergan for a total of $1,152 million). It also reduced the liability by $820 million for the payment of employee termination costs, write-offs of impaired assets, and exit costs. The ending balance of $1,157 million is reported on Pfizer's 2015 balance sheet as a liability.

Analysis of Restructuring Costs

Restructuring costs are typically large and, as such, greatly affect reported profits. Our analysis must consider whether these costs are associated with the accounting period in which they are recognized. Following are some guidelines relating to the components of restructuring costs.

Analyzing employee severance or relocation costs and other costs. Companies are allowed to record costs relating to employee separation or relocation that are *incremental* and that do not benefit future periods. Similarly, other accrued costs must be related to the restructuring and not to expenses that would otherwise have been incurred in the future. Thus, accrual of these costs is treated

like other liability accruals. We must, however, be aware of over- or understated costs and their effect

like other liability accruals. We must, however, be aware of over- or understated costs and their effect on current and future profitability. Disclosure rules require a reconciliation of this restructuring accrual in future years (see the preceding Business Insight on Pfizer's restructuring). A reconciliation reveals either overstatements or understatements: overstatements are followed by a reversal of the restructuring liability, and understatements are followed by further accruals. Should a company develop a reputation for recurring reversals or understatements, its management loses credibility.

Research Insight ■ Restructuring Costs and Managerial Incentives

Research has investigated the circumstances and effects of restructuring costs. Some research finds that stock prices increase when a company announces a restructuring as if the market appreciates the company's candor. Research also finds that many companies that reduce income through restructuring costs later reverse a portion of those costs, resulting in a substantial income boost for the period of reversal. These reversals often occur when the company would have otherwise reported an earnings decline. Whether or not the market responds favorably to trimming the fat or simply disregards restructuring costs as transitory and, thus, as uninformative, managers have incentives to characterize such income-decreasing items as "one-time" on the income statement and routinely exclude such charges in non-GAAP, pro forma disclosures. These incentives often derive from contracts such as debt covenants and managerial bonus plans.

Analyzing asset write-downs. Asset write-downs accelerate (or catch up) the depreciation process to reflect asset impairment. Impairment implies the loss of cash-generating capability and, likely, occurs over several years. Thus, prior periods' profits were arguably not as high as reported, and the current period's profit is not as low. This measurement error is difficult to estimate and, thus, many analysts do not adjust balance sheets and income statements for write-downs. At a minimum, however, we must recognize the qualitative implications of restructuring costs for the profitability of recent prior periods and the current period.

Managerial Decision ■ You Are the Financial Analyst

You are analyzing the 10-K of a company that reports a large restructuring expense, involving employee severance and asset write-downs. How do you interpret and treat this cost in your analysis of the company's current and future profitability? [Answer, p. 6-29]

LO5 **Review 6-5**

Part 1. Refer to information in Review 6-4 and to its solution to answer the following requirements.

Required

a. Assume that the HD subsidiary uses straight-line method of depreciation and estimates that, at the end of the third year, the equipment will generate $40,000 in cash flow over its remaining life and that it has a current fair value of $36,000. Is the equipment impaired? If so, what is the effect on the HD subsidiary financial statements?

b. Instead of the facts in part 1, assume that, at the end of the third year, the HD subsidiary sells the equipment for $50,000 cash. What amount of gain or loss does the HD subsidiary report from this sale?

Part 2. The Coca-Cola Company reports the following reconciliation of its restructuring liability for 2015.

$ millions	Severance Pay and Benefits	Outside Services	Other Direct Costs	Total
Accrued balance as of December 31, 2014	$260	$ 4	$ 21	$285
Costs incurred	$269	$56	$366	$691
Payments	(200)	(47)	(265)	(512)
Noncash and exchange	(185)	(5)	(70)	(260)
Accrued balance as of December 31, 2015	$144	$ 8	$ 52	$204

Required

a. What amount of expense did Coca-Cola report in its income statement as restructuring expense in 2015?

b. What amount of restructuring liability did Coca-Cola report on its balance sheet for 2015?

Solution on p. 6-44.

PPE Assets—Analysis Tools

eLectures MBC **LO6** Analyze tangible assets and related activities.

Home Depot reports $22,191 million of property and equipment, net of accumulated depreciation, on its 2015 balance sheet.

$ millions	January 31, 2016	February 1, 2015
Property and Equipment, at cost	$39,266	$38,513
Less Accumulated Depreciation and Amortization	17,075	15,793
Net Property and Equipment	22,191	22,720

Footnotes disclose the company's policies for depreciation and amortization. As for most companies, Home Depot's disclosures are fairly broad.

Depreciation and Amortization The Company's Buildings, Furniture, Fixtures and Equipment are recorded at cost and depreciated using the straight-line method over the estimated useful lives of the assets. Leasehold Improvements are amortized using the straight-line method over the original term of the lease or the useful life of the improvement, whichever is shorter. The Company's Property and Equipment is depreciated using the following estimated useful lives:

Buildings	5–45 years
Furniture, Fixtures and Equipment	2–20 years
Leasehold Improvements	5–45 years

Home Depot also discloses the composition of property and equipment.

Property and Equipment as of January 31, 2016 and February 1, 2015 consisted of the following (amounts in millions).

Property and Equipment, at cost:	January 31, 2016	February 1, 2015
Land	$□8,149	$□8,243
Buildings	17,667	17,759
Furniture, Fixtures and Equipment	10,279	9,602
Leasehold Improvements	1,481	1,419
Construction in Progress	670	585
Capital Leases	1,020	905
	39,266	38,513
Less Accumulated Depreciation and Amortization	17,075	15,793
Net Property and Equipment	$22,191	$22,720

We can use these data to compute key ratios to assess the productivity of Home Depot's PPE and the assets' relative age.

PPE Turnover

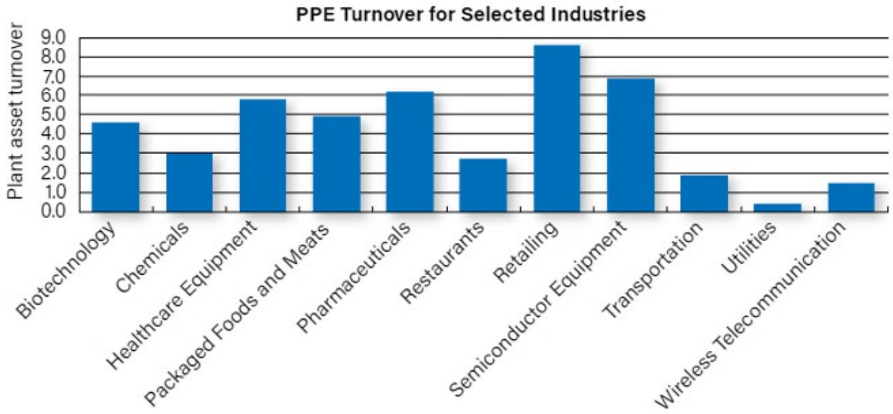
A crucial issue in analyzing PPE is determining their productivity (utilization). For example, what level of plant assets is necessary to generate a dollar of revenues? How capital intensive are the company and its competitors? To address these and similar questions, we use **PPE turnover**, defined as follows.

PPE Turnover (PPET) = Sales / Average PPE, net

Home Depot's 2015 PPE turnover is 3.9 ($88,519 million/[($22,191 million + $22,720 million)/2]). (We use net PPE in the computation above; arguments for using gross PPE are not as compelling as with receivables because managers have less latitude over accumulated depreciation as compared to the allowance for uncollectibles.)

Higher PPE turnover is preferable to lower. A higher PPE turnover implies a lower capital investment for a given level of sales. Higher turnover, therefore, increases profitability because the company avoids asset carrying costs and because the freed-up assets can generate operating cash flow.

PPE turnover is lower for capital-intensive manufacturing companies than it is for companies in service or knowledge-based industries. To this point, consider the following chart of PPE turnover for selected industries.



There is wide variability in PPE turnover rate across industries. Capital intensive industries such as utilities, transportation, and wireless telecommunication report relatively low turnover rates, reflecting large levels of capital investment required to compete in those areas.

PPE Useful Life

Home Depot reports that the useful lives of its depreciable assets range from two years for furniture, fixtures and equipment to 45 years for buildings and leasehold improvements. The longer an asset's useful life, the lower the annual depreciation expense reported in the income statement and the higher the income each year. It might be of interest, therefore, to know whether a company's useful life estimates are more conservative or more aggressive than its competitors.

If we assume straight-line (SL) depreciation (which is consistent with the company's policy) and zero salvage value, we can estimate the average useful life for depreciable assets as follows.

Average useful life = Depreciable asset cost / Depreciation expense

The estimated useful life for Home Depot's PPE is 16.3 years ($30,447 million/$1,863 million). We compute depreciable assets of $30,447 million, by excluding two items.

- Land of $8,149 million, which is never depreciated.
- Construction-in-progress of $670 million, which is not depreciated until the assets under construction are completed and placed into service, which is when the company begins to use the assets.

Home Depot, like most companies, does not report depreciation as a separate line item on the income statement. To determine depreciation and amortization expense, we refer to Home Depot's statement of cash flows, that reports "depreciation and amortization" expense of $1,863 million. Amortization expense is like depreciation expense and typically relates to leasehold improvements

(a catch-all category for fixtures, lights, flooring, and restrooms that Home Depot installed in its

(a catch-all category for fixtures, lights, flooring, and restrooms that Home Depot installed in its leased buildings) and to intangible assets other than goodwill (which is not amortized). Because Home Depot has no intangible assets other than goodwill, we assume that amortization expense relates to leasehold improvements.

PPE Percent Used Up

We can also estimate the proportion of a company's depreciable assets that have already been transferred to the income statement. This ratio reflects the percent of depreciable assets that are no longer productive and is computed as follows.

Percent used up = Accumulated depreciation / Depreciable asset cost

Home Depot's assets are 56% used up, computed as $17,075 million/$30,447 million. If a company replaced all of its assets evenly each year, the percent used up ratio would be 50%. Home Depot's depreciable assets are slightly older than this benchmark. Knowing the degree to which a company's assets are used up is of interest in forecasting future cash flows. If, for example, depreciable assets are 80% used up, we might anticipate a higher level of capital expenditures to replace aging assets in the near future. We also expect that older assets are less efficient and will incur higher maintenance costs.

Managerial Decision ■ You Are the Division Manager

You are the manager for a main operating division of your company. You are concerned that a declining PPE turnover is adversely affecting your division's return on net operating assets. What specific actions can you take to increase PPE turnover? [Answer, p. 6-29]

Review 6-6 LO6

Lowe's Companies Inc. reports the following selected financial data for 2016, 2015, and 2014.

$ millions	2016	2015	2014
Revenue	$59,074	$56,223	$53,417
Depreciation expense	1,484	1,485	1,462
Gross property, plant, and equipment	35,913	35,443	35,074
Accumulated depreciation	(16,336)	(15,409)	(14,240)
Net property, plant and equipment	19,577	20,034	20,834
Footnote data			
Land	7,086	7,040	7,016
Buildings	17,451	17,247	17,161
Machinery	10,863	10,426	10,063
Construction-in-progress	513	730	834

Required

Compute the following measures for 2016 and 2015. (For simplicity, assume that the entire amortization expense relates to property, plant and equipment assets.)

1. PPE turnover.
2. Average useful life.
3. Percent used up.

Solution on p. 6-45.

Both GAAP and IFRS account similarly for operating assets. Although similarities in accounting dwarf any differences, we highlight some of the more notable differences.

Inventory There are only two notable differences in accounting for inventory.

1. IFRS does not permit use of the LIFO method.
2. IFRS permits companies to reverse inventory write-downs; GAAP does not. This means that if markets recover and inventory previously "impaired" regains some or all of its value, it can be revalued upwards. IFRS notes disclose this revaluation, if material, which permits us to recompute inventory and cost of sales amounts that are comparable to GAAP.

Property, plant, and equipment In accounting for tangible assets, four notable differences deserve mention.

1. GAAP requires the total cost of a tangible asset to be capitalized and depreciated over its useful life. Under IFRS, tangible assets are disaggregated into individual components and then each component is separately depreciated over its useful life. Thus, assets with components with vastly different useful lives, can yield IFRS depreciation expense that is markedly different from that computed using GAAP.
2. Property, plant and equipment can be revalued upward to fair market value under IFRS. The latter will cause IFRS book values of PPE to be higher. Few companies have opted to revalue assets upwards but in some industries, such as real estate, the practice is common.
3. U.S. GAAP applies a two-step approach for determining impairments. Step 1: compare book value to *undiscounted* expected future cash flows; and Step 2: if book value is higher, measure impairment using *discounted* expected future cash flows. IFRS uses *discounted* expected future cash flows for both steps, which means IFRS uses one step. This results in more asset impairments under IFRS.
4. IFRS fair-value impairments for tangible assets can be reversed; that is, written back up after being written down. The notes to PPE articulate such reversals.

Research and Development All R&D costs are expensed under GAAP whereas IFRS allows development costs (but not research costs) to be capitalized as an intangible asset if all of the following six criteria are met.

- It is technically feasible to complete the asset.
- The company intends to complete the asset and use or sell it.
- The company is able to use or sell the asset.
- The company can use the asset to create economic benefits or there is a profitable market for the asset.
- The company has adequate resources to complete the asset.
- Costs related to the asset can be reliably measured.

For some companies and some industries these intangible assets are significant and the IFRS financial statements can be markedly different.

Restructuring There are two differences worth noting.

1. Under IFRS, restructuring expense is recognized when there is a plan for the restructuring and if the affected employees expect the plan to be implemented. Under GAAP, restructuring expense can be recognized earlier because the trigger is board approval of a plan.
2. Consistent with other IFRS accruals, a restructuring provision is recorded at its best estimate. This is usually the expected value or, in the case of a range of possible outcomes that are equally likely, the provision is recorded at the *midpoint* of the range. The GAAP estimate is at the most-likely outcome; and if there is a range of possible outcomes, the provision is recorded as the *minimum* amount of the range.

Guidance Answers

You Are the Operations Manager

Pg. 6-15 Companies need inventories to avoid lost sales opportunities; however, there are several ways to minimize inventory needs. (1) We can reduce product costs by improving product design to eliminate costly features that customers don't value. (2) We can use more cost-efficient suppliers; possibly producing in lower wage-rate parts of the world. (3) We can reduce raw material inventories with just-in-time delivery from suppliers. (4) We can eliminate production bottlenecks that increase work-in-process inventories. (5) We can manufacture for orders rather than for estimated demand to reduce finished goods inventories. (6) We can improve warehousing and distribution to reduce duplicate inventories. (7) We can monitor product sales and adjust product mix as demand changes to reduce finished goods inventories.

You Are the Financial Analyst

Pg. 6-24 Typically, restructuring charges have three components: severance costs, other restructuring-related expenses and asset write-downs (including inventories, PPE, intangible assets, and goodwill). Write-downs occur when an asset's ability to generate cash flow declines and this decline reduces the asset's fair value below its book value (as reported on the balance sheet). Arguably, this decline in cash flow generating ability did not occur solely in the current year. Most likely the decline developed over several periods. It is not uncommon for companies to delay loss recognition, such as write-downs of assets. Thus, prior period income is, arguably, overstated and the current period loss is understated. Turning to severance and other costs, GAAP permits restructuring expense to include only those costs that are *incremental* and will *not* benefit future periods. Like other accruals, restructuring might be over- or understated. In future periods, the company reports actual restructuring expenses, which will provide insight into the adequacy of the accrual in the earlier period.

You Are the Division Manager

Pg. 6-27 PPE is a difficult asset to reduce. Because companies need long-term operating assets, managers usually try to maximize throughput to reduce unit costs. Also, many companies form alliances to share administrative, production, logistics, customer service, IT, and other functions. These alliances take many forms (such as joint ventures) and are designed to spread ownership of assets among many users. The goal is to identify underutilized assets and to increase capacity utilization. Another solution might be to reconfigure the value chain from raw material to end user. Examples include the sharing of IT, or manufacturing facilities, outsourcing of production or administration such as customer service centers, and the use of special purpose entities for asset securitization.

Questions

Q6-1. Why do relatively stable inventory costs across periods reduce the importance of management's choice of an inventory costing method?

Q6-2. Explain why using the FIFO inventory costing method will increase gross profit during periods of rising inventory costs.

Q6-3. If inventory costs are rising, which inventory costing method—first-in, first-out; last-in, first-out; or average cost—yields the (a) lowest ending inventory? (b) lowest net income? (c) largest ending inventory? (d) largest net income? (e) greatest cash flow, assuming the same method is used for tax purposes?

Q6-4. Even though it may not reflect their physical flow of goods, why might companies adopt last-in, first-out inventory costing in periods when costs are consistently rising?

Kaiser Aluminum Corporation (KALU)

Q6-5. In a recent annual report, **Kaiser Aluminum Corporation** made the following statement in reference to its inventories: "The Company recorded pretax charges of approximately $19.4 million because of a reduction in the carrying values of its inventories caused principally by prevailing lower prices for alumina, primary aluminum, and fabricated products." What basic accounting principle caused Kaiser Aluminum to record this $19.4 million pretax charge? Briefly describe the rationale for this principle.

Q6-6. What does the cash conversion cycle measure?

Q6-7. How might a company revise its depreciation expense computation due to a change in an asset's estimated useful life or salvage value?

Q6-8. What is the benefit of accelerated depreciation for income tax purposes when the total depreciation

Q6-8. What is the benefit of accelerated depreciation for income tax purposes when the total depreciation taken over the asset's life is identical under any method of depreciation?

Q6-9. What factors determine the gain or loss on the sale of a PPE asset?

Q6-10 What is a LIFO reserve? What information can we learn from the LIFO reserve *and* from the change in the reserve during the year?

Q6-11 Explain the concept of lower of cost or market. What benefit does the LCM rule create for financial statement users?

Q6-12. Identify the three typical categories of restructuring costs and their effects on the balance sheet and the income statement.

Assignments with the MBC logo in the margin are available in myBusinessCourse. See the Preface of the book for details.

Mini Exercises

M6-13. Computing Cost of Goods Sold and Ending Inventory Under FIFO, LIFO, and Average Cost LO1

Assume that Madden Company reports the following initial balance and subsequent purchase of inventory.

Inventory balance at beginning of year	1,300 units @ $150 each	$195,000
Inventory purchased during the year	1,700 units @ $180 each	306,000
Cost of goods available for sale during the year	3,000 units	$501,000

Assume that 2,000 units are sold during the year. Compute the cost of goods sold for the year and the inventory on the year-end balance sheet under the following inventory costing methods:

a. FIFO
b. LIFO
c. Average Cost

M6-14. Computing Cost of Goods Sold and Ending Inventory Under FIFO, LIFO, and Average Cost LO1

Wong Corporation reports the following beginning inventory and inventory purchases.

Inventory balance at beginning of year	400 units @ $12 each	$□4,800
Inventory purchased during the year	700 units @ $14 each	9,800
Cost of goods available for sale during the year	1,100 units	$14,600

Wong sells 600 of its inventory units during the year. Compute the cost of goods sold for the year and the inventory on the year-end balance sheet under the following inventory costing methods:

a. FIFO
b. LIFO
c. Average Cost

M6-15. Computing and Evaluating Inventory Turnover for Two Companies LO3

Abercrombie & Fitch Co. (ANF) and TJX Companies Inc. (TJX) report the following information in their respective January 2016 10-K reports relating to their 2012 and 2011 fiscal years.

Abercrombie & Fitch Co. (ANF)
TJX Companies Inc. (TJX)

Homework MBC

	Abercrombie & Fitch			TJX Companies		
$ millions	Sales	Cost of Goods Sold	Inventories	Sales	Cost of Goods Sold	Inventories
2015	$3,519	$1,361	$437	$30,945	$22,035	$3,695
2014	3,744	1,430	461	29,078	20,777	3,218

a. Compute the 2015 inventory turnover for each of these two retailers.

b. Discuss any difference you observe in inventory turnover between these two companies. Does the

b. Discuss any difference you observe in inventory turnover between these two companies. Does the difference confirm your expectations given their respective business models? Explain. (*Hint:* ANF is a higher-end retailer and TJX sells more value-priced clothing.)
c. Describe ways that a retailer can improve its inventory turnover.

LO4 **M6-16. Computing Depreciation Under Straight-Line and Double-Declining-Balance**

A delivery van costing $37,000 is expected to have a $2,900 salvage value at the end of its useful life of five years. Assume that the truck was purchased on January 1. Compute the depreciation expense for the first two calendar years under the following depreciation methods.

a. Straight-line
b. Double-declining-balance

LO4 **M6-17. Computing Depreciation Under Straight-Line and Double-Declining-Balance for Partial Years**

A company with a calendar year-end, purchases a machine costing $129,000 on July 1, 2016. The machine is expected to be obsolete after five years (60 months) and, thereafter, no longer useful to the company. The estimated salvage value is $6,000. The company's depreciation policy is to record depreciation for the portion of the year that the asset is in service. Compute depreciation expense for both 2016 and 2017 under the following depreciation methods.

a. Straight-line
b. Double-declining-balance

LO6 **M6-18. Computing and Comparing PPE Turnover for Two Companies**

Texas Instruments Inc. (TXN)
Intel Corporation (INTC)

Texas Instruments Inc. and **Intel Corporation** report the following information.

	Intel Corporation		Texas Instruments	
$ millions	Sales	Plant, Property and Equipment, net	Sales	Plant, Property and Equipment, net
2015	$55,355	$31,858	$13,000	$2,596
2014	55,870	33,238	13,045	2,840

a. Compute the 2015 PPE turnover for both companies. Comment on any difference observed.
b. Discuss ways in which high-tech manufacturing companies like these can increase their PPE turnover.

LO3 **M6-19. Computing Cash Conversion Cycle for Two Years**

Winnebago Industries (WGO)

Winnebago Industries has the following metrics for 2015 and 2014.

Amounts in days	2015	2014
Days sales outstanding	25.5	19.1
Days inventory outstanding	47.1	48.9
Days payable outstanding	13.9	13.3

Compute the cash conversion cycle for both years. What accounts for the change between the years?

LO3 **M6-20. Using Inventory Analysis Tools**

AutoZone (AZO)
O'Reilly (ORLY)

AutoZone and **O'Reilly** are two competitors in the retail automotive parts industry.

$ thousands	AutoZone	O'Reilly
Average 2015 Inventory	$□3,280,868	$2,592,902
2015 Sales	10,187,340	7,966,674
2015 Cost of goods sold	4,860,309	3,804,031
Average 2014 Inventory	$□3,000,557	$2,464,918
2014 Sales	9,475,313	7,216,081
2014 Cost of goods sold	4,540,406	3,507,180

a. Use the information above to compute the companies' gross profit margin and days inventory outstanding for both years.

b. Based on these two ratios, which company is more profitable selling its inventory? How has that

b. Based on these two ratios, which company is more profitable selling its inventory? How has that changed from 2014 to 2015?

c. Based on these two ratios, which company is more efficient with its inventory? How has that changed from 2014 to 2015?

M6-21. Asset Impairment LO5 Winnebago Industries (WGO)

In 2015, **Winnebago Industries** recorded an impairment loss of $462,000 on its corporate plane. Assume that the plane originally cost the company $2,350,000 and had accumulated depreciation of $1,598,000 at the time of the impairment charge.

a. Why did the company record an impairment loss on the plane?

b. Explain how the company determined the amount of the impairment loss.

c. What was the plane's fair value at the end of 2015?

M6-22. Lower of Cost or Market Adjustment LO2 Marathon Petroleum Corporation (MPC)

Marathon Petroleum Corporation disclosed the following in its 2015 annual report. The company reported revenues and cost of revenues of $72,051 million and $55,583 million respectively in 2015.

> Inventories are stated at the lower of cost or market. Costs of crude oil, refinery feedstocks and refined products are aggregated on a consolidated basis for purposes of assessing if the LIFO cost basis of these inventories may have to be written down to market values. At December 31, 2015, market values for these inventories, which totaled approximately 4.0 billion gallons, were lower than their LIFO cost basis and, as a result, we recorded an inventory valuation charge of $345 million to cost of revenues to value these inventories at the lower of cost or market.

a. Compute gross profit margin for 2015.

b. What would gross profit margin and the gross profit margin percentage have been if the company had not had to record the lower of cost or market adjustment?

c. At the end of the year, Marathon's LIFO reserve was $684 million. If the company had used FIFO, what would the inventory valuation charge have been?

Exercises

E6-23. Applying and Analyzing Inventory Costing Methods LO1

At the beginning of the current period, Chen carried 1,000 units of its product with a unit cost of $32. A summary of purchases during the current period follows.

	Units	Unit Cost	Cost
Beginning Inventory.....	1,000	$32	$32,000
Purchases: #1.....	1,800	34	61,200
#2.....	800	38	30,400
#3.....	1,200	41	49,200

During the current period, Chen sold 2,800 units.

a. Assume that Chen uses the first-in, first-out method. Compute both cost of goods sold for the current period and the ending inventory balance. Use the financial statement effects template to record cost of goods sold for the period.

b. Assume that Chen uses the last-in, first-out method. Compute both cost of goods sold for the current period and the ending inventory balance.

c. Assume that Chen uses the average cost method. Compute both cost of goods sold for the current period and the ending inventory balance.

d. Which of these three inventory costing methods would you choose to:

1. Reflect what is probably the physical flow of goods? Explain.
2. Minimize income taxes for the period? Explain.
3. Report the largest amount of income for the period? Explain.

LO3 E6-24. Analyzing an Inventory Footnote Disclosure

LO2 **E6-24. Analyzing an Inventory Footnote Disclosure**

General Electric Company (GE)

General Electric Company reports the following footnote in its 10-K report. The company reports its inventories using the LIFO inventory costing method.

Homework MBC

December 31 ($ millions)	2015	2014
Raw materials and work in process	$13,415	$9,963
Finished goods	8,199	6,982
Unbilled shipments	628	755
	22,243	17,701
Less revaluation to LIFO	206	(62)
	$22,449	$17,639

a. What is the balance in inventories reported on GE's 2015 balance sheet?

b. What would GE's 2015 balance sheet have reported for inventories had the company used FIFO inventory costing?

c. What cumulative effect has GE's choice of LIFO over FIFO had on its pretax income as of year-end 2015? Explain.

d. Assume GE has a 35% income tax rate. As of the 2015 year-end, how much has GE saved in taxes by choosing LIFO over FIFO method for costing inventory? Has the use of LIFO increased or decreased GE's cumulative taxes paid?

e. What effect has the use of LIFO inventory costing had on GE's pretax income and tax expense for 2015 only (assume a 35% income tax rate)?

LO1 **E6-25. Computing Cost of Sales and Ending Inventory**

Howell Company has the following financial records for the current period.

Homework MBC

	Units	Unit Cost
Beginning inventory	150	$100
Purchases: #1	600	96
#2	500	92
#3	250	90

Ending inventory is 350 units. Compute the ending inventory and the cost of goods sold for the current period using (a) first-in, first-out, (b) average cost, and (c) last-in, first-out.

LO2 **E6-26. Analyzing an Inventory Footnote Disclosure**

Deere & Co. (DE)

The inventory footnote from **Deere & Company**'s 2015 10-K follows.

Homework MBC

Inventories Most inventories owned by Deere & Company and its U.S. equipment subsidiaries are valued at cost, on the "last-in, first-out" (LIFO) basis. Remaining inventories are generally valued at the lower of cost, on the "first-in, first-out" (FIFO) basis, or market. The value of gross inventories on the LIFO basis represented 66 percent and 65 percent of worldwide gross inventories at FIFO value at October 31, 2015 and 2014, respectively. If all inventories had been valued on a FIFO basis, estimated inventories by major classification at October 31 in millions of dollars would have been as follows:

$ millions	2015	2014
Raw materials and supplies	$1,559	$1,724
Work-in-process	450	654
Finished goods and parts	3,234	3,360
Total FIFO value	5,243	5,738
Less adjustment to LIFO value	1,426	1,528
Inventories	$3,817	$4,210

This footnote reveals that not all of Deere's inventories are reported using the same inventory costing

LO2 **E6-24. Analyzing an Inventory Footnote Disclosure**

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Ending inventory is 350 units. Compute the ending inventory and the cost of goods sold for the current period using (a) first-in, first-out, (b) average cost, and (c) last-in, first-out.

LO2 **E6-26. Analyzing an Inventory Footnote Disclosure**

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Inventories Most inventories owned by Deere & Company and its U.S. equipment subsidiaries are valued at cost, on the "last-in, first-out" (LIFO) basis. Remaining inventories are generally valued at the lower of cost, on the "first-in, first-out" (FIFO) basis, or market. The value of gross inventories on the LIFO basis represented 66 percent and 65 percent of worldwide gross inventories at FIFO value at October 31, 2015 and 2014, respectively. If all inventories had been valued on a FIFO basis, estimated inventories by major classification at October 31 in millions of dollars would have been as follows:

$ millions	2015	2014
Raw materials and supplies	$1,559	$1,724
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Total FIFO value	5,243	5,738
Less adjustment to LIFO value	1,426	1,528
Inventories	$3,817	$4,210

This footnote reveals that not all of Deere's inventories are reported using the same inventory costing

This footnote reveals that not all of Deere's inventories are reported using the same inventory costing method (companies can use different inventory costing methods for different inventory pools).

a. What amount does Deere report for inventories on its 2015 balance sheet?
b. What would Deere have reported as inventories on its 2015 balance sheet had the company used FIFO inventory costing for all of its inventories?
c. What cumulative effect has the use of LIFO inventory costing had, as of year-end 2015, on Deere's pretax income compared with the pretax income it would have reported had it used FIFO inventory costing for all of its inventories? Explain.
d. Assuming a 35% income tax rate, by what cumulative dollar amount has Deere's tax expense been affected by use of LIFO inventory costing as of year-end 2015? Has the use of LIFO inventory costing increased or decreased Deere's cumulative tax expense?
e. What effect has the use of LIFO inventory costing had on Deere's pretax income and tax expense for 2015 only (assume a 35% income tax rate)?

E6-27. Computing Straight-Line and Double-Declining-Balance Depreciation LO4

On January 2, Reed Company purchases a laser cutting machine for use in fabrication of a part for one of its key products. The machine cost $75,000, and its estimated useful life is five years, after which the expected salvage value is $5,000. For both parts *a* and *b* below: (1) Compute depreciation expense for *each year* of the machine's five-year useful life under that depreciation method. (2) Use the financial statements effects template to show the effect of depreciation for the first year only for that method. (When equipment is used exclusively in the manufacturing process, the depreciation is more accurately recorded as part of cost of goods sold and not as depreciation expense.)

a. Straight-line
b. Double-declining-balance

E6-28. Computing Depreciation, Net Book Value, and Gain or Loss on Asset Sale LO4, 5

Zimmer Company owns an executive plane that originally cost $1,280,000. It has recorded straight-line depreciation on the plane for seven full years, calculated assuming an $160,000 expected salvage value at the end of its estimated 10-year useful life. Zimmer disposes of the plane at the end of the seventh year.

a. At the disposal date, what is the (1) cumulative depreciation expense and (2) net book value of the plane?
b. How much gain or loss is reported at disposal if the sales price is:
1. A cash amount equal to the plane's net book value.
2. $285,000 cash.
3. $700,000 cash.

E6-29. Computing Straight-Line and Double-Declining-Balance Depreciation LO4

On January 2, 2016, Fischer Company purchases a machine that manufactures a part for one of its key products. The machine cost $264,600 and is estimated to have a useful life of six years, with an expected salvage value of $22,500. Compute depreciation expense for 2016 and 2017 for the following depreciation methods.

a. Straight-line.
b. Double-declining-balance.

E6-30. Computing Depreciation, Net Book Value, and Gain or Loss on Asset Sale

Lynch Company owns and operates a delivery van that originally cost $46,400. Lynch has recorded straight-line depreciation on the van for four years, calculated assuming a $5,000 expected salvage value at the end of its estimated six-year useful life. Depreciation was last recorded at the end of the fourth year, at which time Lynch disposes of this van.

a. Compute the net book value of the van on the disposal date.
b. Compute the gain or loss on sale of the van if the disposal proceeds are:
1. A cash amount equal to the van's net book value.
2. $21,000 cash.
3. $17,000 cash.

LO6 **E6-31. Estimating Useful Life and Percent Used Up**

LO6 Deere & Co. (DE)

E6-31. Estimating Useful Life and Percent Used Up

The property and equipment footnote from the **Deere & Company** Equipment and Operations segment follows.

Property and Depreciation A summary of property and equipment at October 31 follows.

Property and Equipment ($ millions)	Useful Lives* (Years)	2015	2014
Land		$□□ 114	$□ 120
Buildings and building equipment	23	3,016	3,037
Machinery and equipment	11	5,055	5,089
Dies, patterns, tools, etc.	8	1,567	1,552
All other	5	875	889
Construction in progress		345	530
Total at cost		10,972	11,217
Less accumulated depreciation		5,846	5,694
Total		$□5,126	$5,523

* Weighted averages

Total property and equipment additions in 2015, 2014 and 2013 were $666 million, $1,016 million and $1,158 million, and depreciation was $692 million, $696 million and $637 million, respectively.

a. Compute the estimated useful life of Deere's depreciable assets at year-end 2015. How does this estimate compare with the useful lives reported in Deere's footnote disclosure?

b. Estimate the percent used up of Deere's depreciable assets at year-end 2015. How do you interpret this figure?

LO3, 6 Intel Corp. (INTC)

E6-32. Computing and Evaluating Inventory and PPE Turnovers

Intel Corporation reports the following financial statement amounts in its 2015 10-K report.

$ millions	Sales	Cost of Goods Sold	Inventories	Plant, property, and equipment, net
2013	$52,708	$21,187	$4,172	$31,428
2014	55,870	20,261	4,273	33,238
2015	55,355	20,676	5,167	31,858

a. Compute the inventory and PPE turnover ratios for both 2014 and 2015.

b. What changes are evident in the turnover rates of Intel for these years? Discuss ways in which a company such as Intel can improve inventory and PPE turnover ratios.

LO4, 5

E6-33. Computing and Assessing Plant Asset Impairment

On July 1, Arcola Company purchases equipment for $330,000. The equipment has an estimated useful life of 10 years and expected salvage value of $40,000. The company uses straight-line depreciation. Four years later, economic factors cause the fair value of the equipment to decline to $160,000. On this date, Arcola examines the equipment for impairment and estimates $185,000 in undiscounted expected cash inflows from this equipment.

a. Compute the annual depreciation expense relating to this equipment.

b. Compute the equipment's net book value at the end of the fourth year.

c. Apply the test of impairment to this equipment as of the end of the fourth year. Is the equipment impaired? Show supporting computations.

d. If the equipment is impaired at the end of the fourth year, compute the impairment loss.

E6-34. Computing Asset Related Ratios LO6

E6-34. Computing Asset Related Ratios

LO6
Dick's Sporting Goods (DKS)

Dick's Sporting Goods included the following information in its year-end 2015 10-K.

Sales	$7,270,965
PPE, gross	2,665,314
Land	—
Construction in progress	124,400
Accumulated depreciation	1,317,429
PPE, net, at year-end 2014	1,203,382
Depreciation expense	193,594

Required

a. Compute PPE turnover.
b. Compute the average useful life.
c. Compute the percentage used up of the PPE.

Problems

P6-35. Evaluating Turnover Ratios Across Industries

LO3, 6
Nike (NKE)
Best Buy (BBY)
Johnson & Johnson (JNJ)
Boeing (BA)

The table that follows reports balance sheet and income statement information for Nike, Best Buy, Johnson & Johnson, and Boeing from their year-end 2015 SEC filings.

$ millions	Sales	Cost of Goods Sold	Inventory, 2015	Inventory, 2014	PPE, net
Nike	$30,601	$16,534	$4,337	$3,947	$3,011
Best Buy	39,528	30,334	5,051	5,174	2,346
Johnson & Johnson	70,074	21,536	8,053	8,184	15,905
Boeing (product sales)	85,255	73,446	47,257	46,756	12,076

Required

a. Compute the days inventory outstanding for each company for 2015.
b. Compare the days inventory outstanding across the four companies and consider the industries in which they operate. What do we observe?
c. Compute the PPE turnover for each company.
d. Why is the PPE turnover for Best Buy so much higher than that for Boeing?
e. Which metric is likely easier for these companies to improve, inventory days outstanding or PPE turnover? Explain.

P6-36. Analyzing and Interpreting Inventories and Converting LIFO to FIFO for Ratio Calculation

LO2, 3
Dow Chemical Co. (DOW)

The current asset section from The Dow Chemical Company's 2015 annual report follows.

December 31 ($ millions)	2015	2014
Cash and cash equivalents	$8,577	$5,654
Accounts and notes receivable		
Trade (net of allowance for doubtful receivables—2015: $94; 2014: $110)	4,078	4,685
Other	3,768	4,687
Inventories	6,871	8,101
Deferred income tax assets—current	827	812
Other current assets	354	316
Total current assets	$24,475	$24,255

The Dow Chemical inventory footnote follows.

The following table provides a breakdown of inventories.

Inventories at December 31 ($ millions)	2015	2014
Finished goods	$3,850	$4,547
Work in process	1,506	1,905
Raw materials	747	797
Supplies	768	852
Total inventories	$6,871	$8,101

The reserves reducing inventories from a FIFO basis to a LIFO basis amounted to $8 million at December 31, 2015 and $569 million at December 31, 2014. Inventories valued on a LIFO basis, principally hydrocarbon and U.S. chemicals and plastics product inventories, represented 30 percent of the total inventories at December 31, 2015 and 29 percent of total inventories at December 31, 2014.

A reduction of certain inventories resulted in the liquidation of some of the Company's LIFO inventory layers, increasing pretax income $3 million in 2015, decreasing pretax income $23 million in 2014, and increasing pretax income $55 million in 2013.

Required

a. What inventory costing method does Dow Chemical use? As of 2015, what is the effect on cumulative pretax income and cash flow of using this inventory costing method? (Assume a 35% tax rate.) What is the effect on 2015 pretax income and cash flow of using this inventory costing method?

b. Compute inventory turnover and average inventory days outstanding for 2015 (2015 cost of goods sold is $48,778 million). Comment on the level of these two ratios. Is the level what you expected?

c. Determine the FIFO values for inventories for 2014 and 2015, and cost of goods sold for 2015. Recompute inventory turnover and DIO. Compare the ratios to those from part *b*. Which set of ratios would provide more useful analysis?

d. Explain why a reduction of inventory quantities increased income in 2013 through 2015.

LO6 Abbott Laboratories (ABT)

P6-37. Estimating Useful Life and Percent Used Up

The property and equipment section of the **Abbott Laboratories** 2015 balance sheet follows.

	December 31		
Property and equipment, at cost ($ millions)	2015	2014	2013
Land	$□□ 432	$□□ 457	$□□ 502
Buildings	2,769	2,968	2,994
Equipment	8,254	8,480	8,506
Construction in progress	928	727	868
	12,383	12,632	12,870
Less: accumulated depreciation and amortization	6,653	6,697	6,965
Net property and equipment	$□5,730	$□5,935	$□5,905

The company also provides the following disclosure relating to the useful lives of its depreciable assets.

Property and Equipment—Depreciation and amortization are provided on a straight-line basis over the estimated useful lives of the assets. The following table shows estimated useful lives of property and equipment:

Classification	Estimated Useful Lives
Buildings	10 to 50 years (average 27 years)
Equipment	3 to 20 years (average 11 years)

During 2015, the company reported $871 million for depreciation expense

During 2015, the company reported $871 million for depreciation expense.

Required

a. Compute the estimated useful life of Abbott Laboratories' depreciable assets. How does this compare with its useful lives footnote disclosure above?

b. Compute the estimated percent used up of Abbott Laboratories' depreciable assets. How do you interpret this figure?

P6-38. Interpreting and Applying Disclosures on Property and Equipment LO5, 6

Facebook Inc. (FB)

Following are selected disclosures from the 10-K report of **Facebook Inc.**

Property and Equipment, Net

$ millions	2015	2014
Land	$□ 596	$□ 153
Buildings	2,273	1,420
Leasehold equipment	447	304
Network equipment	3,633	3,020
Computer software, office equipment and other	248	149
Construction in progress	622	738
Total	7,819	5,784
Less: Accumulated depreciation	(2,132)	(1,817)
Property and equipment, net	$5,687	$3,967

Depreciation expense on property and equipment was $1.22 billion, $923 million, and $857 million during 2015, 2014 and 2013, respectively.

Required

a. Compute the PPE turnover for 2015 (Sales in 2015 are $17.928 million).

b. Estimate the useful life, on average, for its depreciable PPE assets.

c. By what percentage are Facebook's assets "used up" at year-end 2015? What implication does the assets used up computation have for forecasting cash flows?

d. Consider the ratios in parts *a*, *b*, and *c*. Interpret them in light of the company's age and business model.

e. The list of PPE assets includes an asset labeled "Construction in progress." What is this asset and what types of costs are included in the $622 million on the balance sheet?

P6-39. Analyzing and Interpreting Restructuring Costs and Effects LO5

Hewlett-Packard Inc. (HPQ)

Hewlett-Packard Inc. reports the following footnote disclosure (excerpted) in its 2015 10-K relating to its 2012 restructuring program.

Fiscal 2015 Restructuring Plan In connection with the Separation, on September 14, 2015, HP's Board of Directors approved a cost saving and investment proposal which includes a restructuring plan (the "2015 Plan") which will be implemented through fiscal 2018. As part of the 2015 Plan, HP expects up to approximately 33,300 employees to exit the company by the end of 2018. These workforce reductions are primarily associated with the ES segment. The changes to the workforce will vary by country, based on local legal requirements and consultations with employee works councils and other employee representatives, as appropriate. HP estimates that it will incur aggregate pre-tax charges through fiscal 2018 of approximately $2.9 billion in connection with the 2015 Plan, of which the estimated cost for HP Inc. is approximately $280 million. Total estimated charges as a result of workforce reductions are approximately $2.4 billion and total estimated charges for real estate consolidation are approximately $506 million.

Fiscal 2012 Restructuring Plan On May 23, 2012, HP adopted a multi-year restructuring plan (the "2012 Plan") designed to simplify business processes, accelerate innovation and deliver better results for customers, employees and stockholders. As of October 31, 2015 HP eliminated 55,800 positions in connection with the 2012 Plan, with a portion of those employees exiting the company as part of voluntary enhanced early retirement ("EER") programs in the U.S. and in

continued

continued from previous page

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certain other countries. HP recognized $5.5 billion in total aggregate charges in connection with the 2012 Plan, with $4.9 billion related to workforce reductions, including the EER programs, and $589 million related to infrastructure, including data center and real estate consolidation and other items. The severance and infrastructure related cash payments associated with the 2012 Plan are expected to be paid out through fiscal 2021. As of October 31, 2015, the 2012 Plan is considered completed. HP does not expect any additional charges to this plan.

Other Plans Restructuring plans initiated by HP in fiscal 2008 and 2010 were substantially completed as of October 31, 2015. Severance and infrastructure related cash payments associated with the other plans are expected to be paid out through fiscal 2019.

$ millions	Balance, October 31, 2014	Charges	Cash Payments	Other Adjustments & Non-cash Settlements	Balance, October 31, 2015
Fiscal 2015 Plan					
Severance	$ —	$390	$ —	$ —	$390
Infrastructure and other	—	1	(1)	—	—
Total 2015 Plan	—	391	(1)	—	390
Fiscal 2012 Plan					
Severance and EER	955	566	(1,101)	(78)	342
Infrastructure and other	98	74	(120)	(4)	48
Total 2012 Plan	1,053	640	(1,221)	(82)	390
Other plans					
Severance	7	(4)	(1)	(1)	1
Infrastructure	54	(10)	(20)	—	24
Total other plans	61	(14)	(21)	(1)	25
Total restructuring plans	$1,114	$1,017	$(1,243)	$(83)	$805
Reflected in consolidated balance sheets:					
Accrued restructuring	$ 898				$689
Other liabilities	$ 216				$116

Required

a. Briefly describe the company's 2015 restructuring program. Provide two examples of common noncash charges associated with corporate restructuring activities.

b. Using the financial statement effects template, show the effects on financial statements of the (1) 2015 restructuring charge of $1,017 million, and (2) 2015 cash payment of $1,243 million.

c. Assume that instead of accurately estimating the anticipated restructuring charge in 2015, the company overestimated them by $30 million. How would this overestimation affect financial statements in (1) 2015, and (2) 2016 when severance costs are paid in cash?

d. The company reports that the total charges related to the 2015 restructuring plan will amount to $2.9 billion. What is the effect on the 2015 income statement from this restructuring? Why do investors care to know the total charge if it does not impact current-period earnings?

IFRS Applications

LO3 Volkswagen Group Daimler AG

I6-40. Computing and Evaluating Inventory Turnover for Two Companies

European car makers, **Volkswagen Group** (headquartered in Wolfsburg, Germany) and **Daimler AG** (headquartered in Stuttgart, Germany) report the following information.

Euros in millions	Volkswagen Sales	Volkswagen Cost of Goods Sold	Volkswagen Inventories	Daimler Sales	Daimler Cost of Goods Sold	Daimler Inventories
2014	€202,458	€165,934	€31,466	€129,872	€101,688	€20,864
2015	213,292	179,382	35,048	149,467	117,670	23,760

Required

a. Compute the 2015 inventory turnover and the 2015 gross profit margin (in %) for each of these two companies.

b. Discuss any difference in inventory turnover and gross profit margin between these two companies. Does the difference confirm expectations given their respective business models? Explain.

c. How could the companies improve inventory turnover?

I6-41. Estimating Useful Life, Percent Used Up, and Gain or Loss on Disposal LO5, 6 Husky Energy (HSE)

Husky Energy is one of Canada's largest integrated energy companies. Based in Calgary, Alberta, Husky is publicly traded on the Toronto Stock Exchange. The Company operates in Western and Atlantic Canada, the United States and the Asia Pacific Region with upstream and downstream business segments. The company uses IFRS to prepare its financial statements. During 2015, the company reported depreciation expense of $8,484 million. The property and equipment footnote follows.

Property, Plant and Equipment ($ millions)	Oil and Gas Properties	Processing, Transportation and Storage	Upgrading	Refining	Retail and Other	Total
Cost						
December 31, 2014	$ 47,974	$1,296	$ 2,274	$ 6,561	$ 2,632	$ 60,737
Additions	2,128	173	46	452	76	2,875
Acquisitions	57	—	—	—	—	57
Transfers from exploration and evaluation	97	—	—	—	—	97
Intersegment transfers	6	(6)	—	—	—	—
Changes in asset retirement obligations	(107)	—	(7)	(5)	(18)	(137)
Disposals and derecognition	(487)	—	—	(24)	(4)	(515)
Exchange adjustments	720	2	—	1,152	2	1,876
December 31, 2015	$ 50,388	$1,465	$ 2,313	$ 8,136	$ 2,688	$ 64,990
Accumulated depletion, depreciation, amortization and impairment						
December 31, 2014	$(23,687)	$□(527)	$(1,154)	$(1,988)	$(1,394)	$(28,750)
Depletion, depreciation and amortization	(7,811)	(48)	(106)	(365)	(154)	(8,484)
Intersegment transfers	(2)	2	—	—	—	—
Disposals and derecognition	370	—	—	18	2	390
Exchange adjustments	(170)	(1)	—	(341)	—	(512)
December 31, 2015	$(31,300)	$□(574)	$(1,260)	$(2,676)	$(1,546)	$(37,356)
Net book value						
December 31, 2014	$24,287	$□ 769	$ 1,120	$ 4,573	$ 1,238	$ 31,987
December 31, 2015	19,088	891	1,053	5,460	1,142	27,634

Required

a. Compute the estimated useful life of Husky Energy's depreciable assets at year-end 2015. Assume that land is 10% of "Refining."

b. Estimate the percent used up of Husky Energy's depreciable assets at year-end 2015. How do we interpret this figure?

c. Consider the disposals and derecognition during the year. This refers to assets that were sold and removed from the balance sheet during the year. Calculate the net book value of the total PPE disposed during the year. Assume that Husky Energy received C$72 million cash proceeds for the year. Determine the gain or loss on the disposal.

LO1, 3, 6 I6-42. Analyzing and Interpreting Operating Asset Ratios

LO1, 3, 6 Canadian Tire

I6-42. Analyzing and Interpreting Operating Asset Ratios

Canadian Tire Corporation, Limited operates retail stores in Canada that sell general merchandise, clothing, and sporting goods. The company offers everyday products and services to Canadians through more than 1,700 retail and gasoline outlets from coast-to-coast. Canadian Tire uses IFRS, and the asset side of the 2015 balance sheet is as follows.

In Millions of CDN Dollars	2015	2014
Cash and cash equivalents	$□□ 900.6	$□□ 662.1
Short-term investments	96.1	289.1
Trade and other receivables	915.0	880.2
Loans receivable	4,875.5	4,905.5
Merchandise inventories	1,764.5	1,623.8
Income taxes recoverable	42.2	31.9
Prepaid expenses and deposits	96.1	104.5
Assets classified as held for sale	2.3	13.1
Total current assets	8,692.3	8,510.2
Long-term receivables and other assets	731.2	684.2
Long-term investments	153.4	176.0
Goodwill and intangible assets	1,246.8	1,251.7
Investment property	137.8	148.6
Property and equipment	3,978.2	3,743.1
Deferred income taxes	48.1	39.4
Total assets	$14,987.8	$14,553.2

Required

a. Compute inventory turnover and average inventory days outstanding for 2015 (2015 cost of goods sold is C$8,144.3 million). Comment on the level of these two ratios. Is the level what we expect given Canadian Tire's industry? Explain.

b. GAAP allows for FIFO, LIFO, and average cost inventory costing methods. How does IFRS differ?

c. In periods of rising prices, how will net income be affected under the different inventory costing methods?

d. During 2015, the company recorded revenue of C$12,279.6 and depreciation expense of C$312.8 million. Footnotes reported accumulated depreciation on PPE of C$2,791.6 million, and cost of land and construction in progress of C$874.4 million and C$359.4 million respectively. Compute PPE turnover, average useful life, and percent used up for 2015.

Management Applications

LO3, 6

MA6-43. Managing Operating Asset Reduction

Return on net operating assets (RNOA = NOPAT/Average NOA, see Module 4) is commonly used to evaluate financial performance. If managers cannot increase NOPAT, they can still increase this return by reducing the amount of net operating assets (NOA). List specific ways that managers could manage the following operating items.

a. Inventories
b. Plant, property and equipment
c. Accounts payable

Ongoing Project

(This ongoing project began in Module 1 and continues through most of the book; even if previous segments were not completed, the requirements are still applicable to any business analysis.)

1. *Inventory* The following provides some guidance for analysis of a company's inventory.

- What is inventory for the company? Does the company manufacture inventory? What proportion of total

- What is inventory for the company? Does the company manufacture inventory? What proportion of total inventory is raw materials? Work in process? Finished goods?
- Compare the two companies' inventory costing methods. Adjust LIFO inventory and cost of goods sold if necessary. Is the LIFO reserve significant? Estimate the tax savings associated with LIFO costing method. (Use the adjusted COGS and inventory figures for all calculations and ratios.)
- What is the relative size of inventory? How has this changed over the recent three-year period?
- Compute inventory turnover and days inventory outstanding and the cash conversion cycle for all three years reported on the income statement.
- Compute gross profit margin in percentage terms. Consider the current economic environment and the companies' competitive landscape. Can we explain any changes in gross profit levels? Have costs for raw materials and labor increased during the year? Have sales volumes softened? What has happened to unit prices? Read the MD&A to determine senior management's take.
- Does the company face any inventory related risk? What has been done to mitigate this risk? Read the MD&A.

For each point of analysis, compare across companies and over time.

2. *Tangible Assets* The following provides some guidance to the companies' long-term (tangible) assets.
   - Are tangible assets significant for the companies? What proportion of total assets is held as tangible assets (PPE)? What exactly are the companies' tangible assets? That is, what is their nature?
   - Compare the two companies' depreciation policies. Do they differ markedly?
   - What is the relative size of tangible assets? How has this changed over the three-year period?
   - Did the company increase tangible assets during the year? Was the increase for outright asset purchases or did the company acquire assets via a merger or acquisition?
   - Compute PPE turnover for all three years reported on the income statement.
   - Compute the average age of assets and percentage used up.
   - Are any assets impaired? Is the impairment charge significant? Is the impairment specific to the company or is the industry experiencing a downturn?

   For each point of analysis, compare across companies and over time.
3. *Restructuring Activities* Have the companies restructured operations in the past three years?
   - Determine the amount of the expense on the income statement—look in the footnotes or the MD&A for additional information.
   - Are other close competitors also restructuring during this time period?
   - Read the footnotes and assess the company's restructuring plans. How many years will it take to fully execute the plan? What additional expenditures are required?
   - Find the restructuring liability on the balance sheet (again the notes will help). Does the liability seem reasonable over time? Compare it to total assets and total liabilities each year and look for any patterns.

Solutions to Review Problems

Review 6-1—Solution

Preliminary computation: Units in ending inventory = 4,800 available − 2,800 sold = 2,000

1. First-in, first-out (FIFO)

Cost of goods sold computation:	Units		Cost		Total
	1,000	@	$18.00	=	$18,000
	1,800	@	$18.25	=	32,850
	2,800				$50,850
Cost of goods available for sale			$88,450		
Less: Cost of goods sold			50,850		
Ending inventory ($22,800 + $14,800)			**$37,600**		

2. Last-in, first-out (LIFO)

2. Last-in, first-out (LIFO)

Cost of goods sold computation:	Units		Cost		Total
1,200	@	$19.00	=	$22,800	
800	@	$18.50	=	14,800	
800	@	$18.25	=	14,600	
2,800				**$52,200**	

Cost of goods available for sale	$88,450
Less: Cost of goods sold	52,200
Ending inventory ($18,000 + [1,000 × $18.25])	**$36,250**

3. Average cost (AC)

Average unit cost	= $88,450/4,800 units	= $18.427
Cost of goods sold	= 2,800 × $18.427	= $51,596
Ending inventory	= 2,000 × $18.427	= $36,854

4. *a.* FIFO is normally the method that most closely reflects physical flow. For example, FIFO would apply to the physical flow of perishable units and to situations where the earlier units acquired are moved out first because of risk of deterioration or obsolescence.

b. LIFO results in the highest cost of goods sold during periods of rising costs (as in the HD subsidiary case); and, accordingly, LIFO yields the lowest net income and the lowest income taxes.

Review 6-2—Solution

1. Because the $30,000 market value of the inventories is less than the carrying value of the inventories under FIFO inventory costing, the inventories must be written down to their market value with the write-down reported in the income statement as an increase in COGS. The balance sheet will report the inventory at $30,000.
2. Last-in, first-out with LIFO liquidation

Cost of goods sold computation:	Units		Cost		Total
800	@	$18.50	=	$14,800	
1,800	@	$18.25	=	32,850	
200	@	$18.00	=	3,600	
2,800				**$51,250**	

Cost of goods available for sale (Beginning inventory + Purchase #1 + Purchase #2)	$65,650
Less: Cost of goods sold	51,250
Ending inventory (800 × $18)	**$14,400**

The company's LIFO gross profit has increased by $950 ($52,200 − $51,250) because of the LIFO liquidation. The reduction of inventory quantities matched older (lower) cost layers against current selling prices. The company has, in effect, dipped into lower-cost layers to boost current-period profit—all from a simple delay of inventory purchases.

3. The LIFO reserve is computed as the difference between the inventory cost at LIFO and FIFO. This is $37,600 − $36,250 = $1,350. Using LIFO for inventory costing for the subsidiary resulted in $473 of taxes being deferred in the current period, computed as $1,350 × 35%.

Review 6-3—Solution

Review 6-3—Solution

	$ millions	2016	2015	2014
1.	Gross profit margin	$\frac{\$20,570}{\$59,074} = 34.8\%$	$\frac{\$19,558}{\$56,223} = 34.8\%$	$\frac{\$18,476}{\$53,417} = 34.6\%$
2.	Days inventory outstanding	$\frac{365 \times \frac{\$9,458 + \$8,911}{2}}{\$38,504} = 87.1$	$\frac{365 \times \frac{\$8,911 + \$9,127}{2}}{\$36,665} = 89.8$	
3.	Days payable outstanding	$\frac{365 \times \frac{\$5,633 + \$5,124}{2}}{\$38,504} = 51.0$	$\frac{365 \times \frac{\$5,124 + \$5,008}{2}}{\$36,665} = 50.4$	
4.	Cash conversion cycle	0 + 87.1 − 51.0 = 36.1	0 + 89.8 − 50.4 = 39.4	
	Analysis: The cash conversion cycle improved by 3.3 days in 2016, computed as 39.4 − 36.1.			
5.	Δ Cash = Δ Cash Conversion Cycle Days × (COGS/365) = 3.3 days × ($38,504/365 days) = $348 million			

Review 6-4—Solution

1. *a.* Straight-line depreciation expense = ($95,000 − $10,000)/5 years = $17,000 per year
   b. Double-declining-balance rate = 40% (twice straight-line rate = 2 × [100%/5 years] = 40%)

Year	Net Book Value × Rate	Depreciation Expense	Accumulated Depreciation
1.....	$95,000 × 0.40 =	$38,000	$38,000
2.....	($95,000 − $38,000) × 0.40 =	22,800	60,800
3.....	($95,000 − $60,800) × 0.40 =	13,680	74,480
4.....	($95,000 − $74,480) × 0.40 =	8,208	82,688
5.....	($95,000 − $82,688) × 0.40 =	2,312*	85,000

*The formula value of $4,925 is not reported for Year 5 because doing so would depreciate the asset below the estimated salvage value; only the $2,312 needed to reach salvage value is depreciated.

2. The HD subsidiary reports the equipment on its balance sheet at its net book value of $44,000.

Equipment, cost	$95,000
Less accumulated depreciation ($17,000 × 3).....	51,000
Equipment, net (end of Year 3).....	$44,000

Review 6-5—Solution

Part 1.

a. The equipment is impaired since the undiscounted expected cash flows of $40,000 are less than the $44,000 net book value of the equipment. The HD subsidiary must write down the equipment to its fair value of $36,000. The effect of this write-down is to reduce the net book value of the equipment by $8,000 ($44,000 − $36,000) and recognize a loss in the income statement.

b. The HD subsidiary must report a gain on this sale of $6,000, computed as proceeds of $50,000 less the net book value of the equipment of $44,000 (see Review 6-4, part 2).

Part 2.

a. Coca-Cola's restructuring expense for 2015 is the increase in the restructuring liability of $691 million.

b. Coca-Cola reports a restructuring liability of $204 million on its 2015 balance sheet.

Review 6-6—Solution

Review 6-6—Solution

$ millions	2016	2015
PPE turnover	$\frac{\$59,074}{\frac{\$19,577+\$20,034}{2}}=2.98$	$\frac{\$56,223}{\frac{\$20,034+\$20,834}{2}}=2.75$
Average useful life	$\frac{\$17,451+\$10,863}{\$1,484}=19.1$	$\frac{\$17,247+\$10,426}{\$1,485}=18.6$
Percent used up	$\frac{\$16,336}{\$17,451+\$10,863}=57.7\%$	$\frac{\$15,409}{\$17,247+\$10,426}=55.7\%$