CHAPTER

9

Inventories: Special Valuation Issues

OBJECTIVES

After reading this chapter, you will be able to:

1. Understand the lower of cost or market method.
2. Explain the conceptual issues regarding the lower of cost or market method.
3. Understand purchase obligations and product financing arrangements.
4. Explain the valuation of inventory above cost.
5. Use the gross profit method.
6. Understand the retail inventory method.
7. Explain the conceptual issues regarding the retail inventory method.
8. Understand the dollar-value LIFO retail method.
9. Understand the effects of inventory errors on the financial statements.

Relationships That Matter

Inventory is a major asset of many companies, and the measurement of inventory involves management decisions that have a major impact on both the balance sheet and the income statement. Accordingly, financial statement users will pay close attention to inventory changes as they assess the financial health of companies. Typically, increases in raw materials and work-in-process inventories signal increases in production to meet higher anticipated future demand. Increases in finished goods inventory, on the other hand, typically indicate lower demand.

Perceptive users need to understand some special valuation issues related to inventory so that they can more clearly understand inventory's impact on the financial statements. For example, assuming that costs and selling prices move together, a decrease in the cost of inventory may signal a future decline in selling price and usefulness of inventory. Following the principle of conservatism, companies employ a lower of cost or market rule so that they will report inventory losses as soon as they discover them. Other companies, with large amounts of inventory, may

Credit: Comstock Images

find it either impractical to conduct physical inventory counts to prepare interim reports or inefficient to maintain records of individual inventory purchases. Recognizing the relationship between the costs of inventory purchases and selling prices, a company may be able to more efficiently manage its inventory using estimation techniques such as the retail inventory method. In any event, an understanding of key relationships between inventory and other financial and economic phenomena is essential for effective inventory management and control.

For Further Investigation

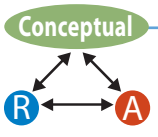
For a discussion of the relationship between inventory and the business cycle, consult the Business & Company Resource Center (BCRC):

- Inventories and the Business Cycle: An Overview. Terry J. Fitzgerald, *Economic Review (Cleveland)*, 0013-0281, Summer 1997, v33, n3, p11.

In Chapter 8 we described the various methods to determine the historical cost of inventory. In certain situations a company does not report its inventory at the historical cost. The alternatives to historical cost are valuation at the lower of cost or market, valuation above cost, and estimation of cost by the gross profit or retail inventory methods, including the dollar-value LIFO retail inventory method. We discuss each of these topics in this chapter, as well as purchase obligations, product financing arrangements, and the effects of errors in inventory on a company's financial statements.

Lower of Cost or Market

1 Understand the lower of cost or market method.



Valuation of inventory at historical cost, based on the cost flow assumption used, is modified when the market value of a company's inventory has declined below its historical cost. This might occur for reasons such as declining costs, obsolescence, or physical deterioration. In these situations the lower of cost or market rule is applied. **The lower of cost or market rule requires that a company write down its inventory to its market value when the inventory's utility has declined.** The write-down of the inventory is appropriate because the utility of the asset has declined. Also, to leave the inventory at its historical cost would overstate both its value and the expected future cash inflows. The lower of cost or market rule is consistent with the conservatism principle. Since the company writes down the asset, it reports a loss (or expense) in its income statement because the decline is an economic event of the period.[1]

Since utility is difficult to measure except through a changed market value, the measurement of the decline in utility is, in practice, always made by valuing the inventory at the lower of cost or market (LCM). **Market value is the current replacement cost** (either by purchase or manufacture) and *not* the selling price.

Application of Lower of Cost or Market Method

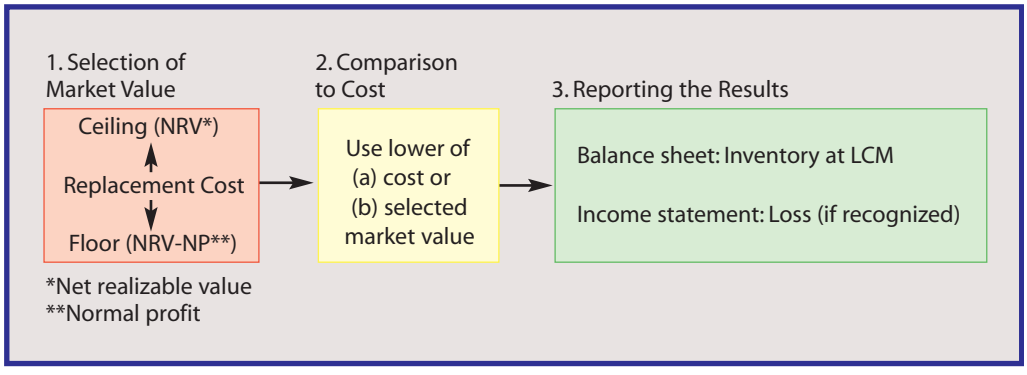
When a company applies the lower of cost or market method, it compares the cost to the market value. It does not always use the current replacement cost as the market value, however. An upper (*ceiling*) and a lower (*floor*) constraint on the market value are imposed as follows:

1. **The upper constraint is that the market value should not exceed the net realizable value** (the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion and disposal).
2. **The lower constraint is that the market value should not be below the net realizable value, reduced by an allowance for a normal profit margin** (normal markup).

These two constraints are used to determine which "market value" (current replacement cost, ceiling, or floor) is to be compared to cost. Note that the appropriate market value is determined before the comparison with the cost is made. **The purpose of the ceiling is to ensure that the write-down of the inventory is enough to cover all expected losses and therefore prevent the recognition of further losses in the future.** In contrast, **the purpose of the floor is to prevent an excessive loss from being recognized and therefore prevent the recognition of excessive profits in the future** (as we discuss later in this section).

1. "Restatement and Revision of Accounting Research Bulletins," *Accounting Research Bulletins, Final Edition, No. 43* (New York: AICPA, 1961), ch. 4, par. 7.

Thus, to apply the lower of cost or market (LCM) method a company completes three steps: it (1) selects the market value, (2) compares the market value to cost, and (3) reports the results in its financial statements, as we show in the following diagram:



In the first step, the company calculates the current replacement cost, ceiling, and floor. It selects the middle value of the three. Then, it chooses the lower of the selected market value or the historical cost. Finally, the company reports the lower value on its balance sheet and, if it recognizes a loss, it reports the amount on the income statement, perhaps including it in cost of goods sold.

To illustrate the first step in the application of the lower of cost or market method, suppose that a company's unit of inventory has the following characteristics:

Selling price	$165
Packaging cost	10
Transportation cost	15
Profit margin	40

The company computes the ceiling and floor as follows:

Selling price	$165
Less: Costs of completion (i.e., packaging)	(10)
Costs of disposal (i.e., transportation)	(15)
Ceiling (net realizable value)	$140
Less: Normal profit margin	(40)
Floor (net realizable value less normal profit)	$100

If the current replacement cost is between $100 and $140, it would be used as the market value. If the replacement cost is above $140, the ceiling would be used; if the replacement cost is below $100, the floor would be used.

We show all three steps in applying the lower of cost or market method in Example 9-1 for a single unit of inventory. We use Cases 5 and 6 to explain the logic behind the ceiling and floor. If in Case 5 the ceiling constraint was ignored and the current replacement cost was used as market, the inventory would be written down only to $105 and a loss of $5 would be recognized. However, in a later period when the unit is sold for $90 (net), there would be an additional loss of $15. Therefore, the inventory would not have been written down to its expected utility, and the total loss due to the decline in utility would not have been recognized in the period in which it occurred. Imposing an upper limit of net realizable value ensures that the full decline in utility is recognized in the period in which it occurred. At first it might be considered unusual that the net realizable value is below the replacement cost (of a new asset), but this can happen when there is physical deterioration to the inventory. If the volume of such items becomes significant, they should be transferred to a separate account.

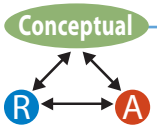
If the floor constraint was ignored in Case 6 and the current replacement cost was used as market, the inventory would be written down to $80 and a loss of $30 would be recognized. However, in a later period when the unit is sold for $140 (net), there would

EXAMPLE 9-1 Application of the Lower of Cost or Market Rule

Case	Current Replacement Cost	Net Realizable Value (Ceiling)	Net Realizable Value Less a Normal Markup (Floor)	Market (Constrained by Ceiling and Floor)	Cost	Lower of Cost or Market Inventory Value*	Loss
1	$120	$140	$100	$120	$110	$110	$ 0
2	150	140	100	140	110	110	0
3	75	140	120	120	110	110	0
4	105	140	100	105	110	105	5
5	105	90	80	90	110	90	20
6	80	140	100	100	110	100	10

*Cases 1, 2 and 3: Cost is used because it is lower than market.
Case 4: Replacement cost is used because it is between floor and ceiling and is less than cost.
Case 5: Net realizable value (ceiling) is used because replacement cost is higher than ceiling and net realizable value is less than cost.
Case 6: Net realizable value less a normal markup (floor) is used because replacement cost is less than floor and net realizable value less a normal markup is less than cost.

be a profit of $60, which is higher than the normal profit of $40. Therefore, the inventory would have been written down below its expected utility, and an excessive loss followed by an excessive profit would have been recognized. Imposing a lower limit of net realizable value less normal profit prevents a write-down below the expected utility of the inventory and the arbitrary transfer of profit from one accounting period to another.



Conceptual Evaluation of the Ceiling and Floor

The implicit assumption for the lower of cost or market method is that selling (exit) prices move in parallel to replacement costs (entry prices) within the constraints of the ceiling and floor. While the two prices are likely to move together, there will be exceptions. Also, the lower of cost or market method may be criticized because it uses three different concepts for the loss recognized in the period. This loss recognition also affects the amount of profit a company will recognize in future periods. These differences create conceptual inconsistencies both within the lower of cost or market method and between that method and other conservative methods.

To illustrate these issues, assume the following facts for 1 unit of inventory of the Sahara Company, a retailer:

Cost:	$19	
Ceiling:	14	(Net realizable value)
Floor:	10	(Net realizable value − Normal profit)

Situation 1

If we also assume that the replacement cost is $15, the ceiling of $14 is used as the market value. Why would the Sahara Company sell an item for $14 when the replacement cost is $15? One explanation would be that the supplier of the inventory has set a lower price on a new product so that the inventory held by the Sahara Company has become obsolete.

The loss in the period of the *write-down* is equal to the net realizable value (ceiling) less the historical cost. The expected profit in the period of *sale* is equal to the net realizable value less the ceiling (the new carrying value of the inventory). The loss and expected profit are:

$$\text{Loss in period of write-down} = \$14 - \$19 = \underline{\underline{\$(5)}}$$

$$\text{Expected profit in period of sale} = \$14 - \$14 = \underline{\underline{\$\ 0}}$$

The loss of $5 is a measure of the expected loss that *would* have been recognized at the time of sale if the lower of cost or market rule had *not* been used. The loss is recognized in the current period instead of in a future period and, therefore, the expected profit at the time of the sale is zero. This loss concept is the same as that applied in other areas where the conservatism principle is used (such as contingencies and construction contracts, which we discuss in Chapters 13 and 18, respectively) because no provision is made for the recognition of a profit when the sale occurs in a future period.

Situation 2

Assume now that the replacement cost is $12. In this situation the replacement cost is used as the market value. Why would the Sahara Company sell an item for $14 when the replacement cost is $12 and its normal profit (the difference between the ceiling and floor) is $4? One explanation would be that the supplier has reduced its price on the product, so that the Sahara Company has to reduce its selling price to remain competitive with other retailers who have reduced their prices.

The loss in the period of the *write-down* is equal to the replacement cost less the historical cost. The expected profit in the period of *sale* is the net realizable value less the replacement cost (the new carrying value of the inventory). The loss and expected profit are:

Loss in period of write-down = $12 − $19
= $(7)

Expected profit in period of sale = $14 − $12
= $ 2

The loss of $7 is the cost saving that was missed because the inventory was purchased before the price decline. This alternative allows the company to recognize a profit of $2 at the time of sale, although it is less than the normal profit of $4.

Situation 3

Assume now that the replacement cost is $9. In this situation the floor of $10 is used as the market value. Why would the Sahara Company be able to sell an item for $14 when the replacement cost is $9 and its normal profit is $4? One explanation would be that the supplier has reduced the price on the product and has so stimulated demand that the retail price has not fallen as much.

The loss in the period of the *write-down* is equal to the floor (net receivable value minus the normal profit) less the historical cost. The expected profit in the period of *sale* is equal to the net realizable value less the floor (the new carrying value of the inventory). The loss and expected profit are:

Loss in period of write-down = $10 − $19
= $(9)

Expected profit in period of sale = $14 − $10
= $ 4

The loss of $9 is the amount needed to provide a normal profit in the future. The expected profit at the time of sale is the normal profit of $4.

The loss concept in Situations 2 and 3 is *not* consistent with the conservatism principle applied in other situations because it allows a company to recognize profits in future periods when the sale is made. Note also that the total loss in all three situations is $5 [$(5) + $0; $(7) + $2; $(9) + $4]. The issue is the inconsistent application of accounting principles, which results in different amounts of loss and profit that a company may recognize in the period of write-down and the period of sale.[2]

2. For additional discussion of these issues, see S.E. Warner and F.D. Whitehurst, "An Illustration of Inventory Loss Measurements Under the LCM Rule," *The Accounting Educators' Journal* (Fall 1988), pp. 32–7.

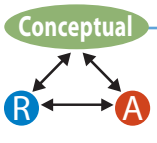
Approaches to Implementing Lower of Cost or Market Rule

A company may apply the lower of cost or market rule to each item or to the total of the inventory (or, in some cases, to the total of the components of each major category). The method used should clearly reflect periodic income.[3]

Applying the rule to each individual item in inventory results in an inventory value less than (or equal to) the values obtained by the other two alternatives. Under these other two alternatives the price declines of some of the units in inventory are offset by price rises in other items. You can see this in Example 9-2, which illustrates the three alternative methods of implementing the lower of cost or market rule for a company in the first year of its operations. To simplify the example, we assume that there was no beginning inventory. Similar results would be obtained if the cost of the beginning inventory was less than or equal to the market value. If the company applies the lower of cost or market rule to individual items, the inventory value is $6,100 and it recognizes a loss of $600 ($6,100 market − $6,700 cost). This method is the most conservative alternative. If the company applies the rule to each category, the inventory value is $6,500 and it recognizes a loss of $200. If the company applies the rule to the total inventory, the value is $6,600 and it recognizes a loss of $100.

EXAMPLE 9-2 Approaches to Implementing Lower of Cost or Market

			LCM applied to:		
Inventory	Cost	Market	Individual Items	Inventory Categories	Total Inventory
Category A:					
Item 1	$1,000	$ 700	$ 700		
Item 2	1,200	1,300	1,200		
	$2,200	$2,000		$2,000	
Category B:					
Item 3	$2,000	$2,400	2,000		
Item 4	2,500	2,200	2,200		
	$4,500	$4,600		4,500	
Total	$6,700	$6,600			$6,600
Inventory valuation			$6,100	$6,500	$6,600
Loss recognition			$ 600	$ 200	$ 100



The use of three alternative methods to account for the *same economic events* is inappropriate, since the qualitative characteristic of *comparability* among companies is enhanced when only one method is allowed. However, in many situations there will be no material differences from the use of the alternative methods. The most common practice is to apply the lower of cost or market rule to each individual item since it is required for income tax purposes and is the most conservative alternative. Of course, the method chosen should be applied consistently each period.

Once the inventory is reduced to market, it is *not* written back up to cost even if the market value subsequently rises above cost. Effectively, the written-down value becomes the new "cost" for subsequent valuation purposes. If the company is using the FIFO or average cost flow assumptions this affects the cost of goods sold in the next period. Therefore, the company may *implicitly* recognize recoveries of losses, as we show in the next section.

3. *Accounting Research Bulletin No. 43, op. cit.*, par. 10.

Recording the Reduction of Inventory to Market

It is acceptable for a company to record the write-down of inventory cost to market value directly in its inventory and cost of goods sold accounts (*direct* method). However, it is more desirable to use a separate inventory valuation account and a loss account (*allowance* method) so that the effects of the write-down can be clearly identified. We illustrate the journal entries for both methods in Example 9-3 for a company using FIFO and the periodic inventory system that has the following inventory values:

	Cost	Market
December 31, 2006	$20,000	$20,000
December 31, 2007	25,000	22,000
December 31, 2008	30,000	28,000

EXAMPLE 9-3 Recording the Reduction of Inventory to Market

	Periodic Inventory System			
	Direct Method		Allowance Method	
December 31, 2007				
1. To close beginning inventory:				
Income Summary	20,000		20,000	
Inventory		20,000		20,000
2. To record ending inventory:				
Inventory	22,000		25,000	
Income Summary		22,000		25,000
3. To record inventory at market:				
Loss Due to Market Valuation	Not required		3,000	
Allowance to Reduce Inventory to Market				3,000
December 31, 2008				
1. To close beginning inventory:				
Income Summary	22,000		25,000	
Inventory		22,000		25,000
2. To record ending inventory:				
Inventory	28,000		30,000	
Income Summary		28,000		30,000
3. To record inventory at market:				
Allowance to Reduce Inventory to Market	Not required		1,000	
Loss Recovery Due to Market Valuation				1,000

LCM: Direct Method (Periodic)

In the *direct* method, the company includes the $3,000 decline in the value of the inventory at the end of 2007 in the year-end closing entry by recording the ending inventory at its lower *market* value of $22,000. Consequently, the Inventory account balance is $3,000 *lower* and Cost of Goods Sold is $3,000 *higher* than they otherwise would be. This lower inventory value of $22,000 is the beginning inventory for 2008. At the end of 2008 the market value is $2,000 below the cost of $30,000, and so the market value of $28,000 is included in the closing entry. The effect of the value of the beginning and ending inventory on cost of goods sold in 2008 should be considered carefully. The market value of the beginning inventory is $3,000 below cost, and this causes the cost of goods sold to be $3,000 *lower* than it otherwise would be. The market value of the ending inventory is $2,000 below cost, and this causes the cost of goods sold to be $2,000 *higher* than it otherwise would be. Therefore, the net effect is that the cost of goods sold is $1,000 lower and gross profit (and income) is $1,000 higher in 2008, because the lower of cost or market value method is used.

LCM: Indirect Method (Periodic)

The same net results are obtained when the *allowance* method is used. However, the method reveals more information about the effect of the lower of cost or market method on a company's cost of goods sold. In the allowance method, a company records the amount by which the market value is below cost in an Allowance account, and shows the effect on the cost of goods sold explicitly in a Loss (or Loss Recovery) account. In the closing entry at the end of 2007, the company records the inventory at its cost of $25,000, and records the decline in value of $3,000 separately in the Loss account and the Allowance account. At the end of 2008 the company records the inventory in the closing entry at its cost of $30,000. As we discuss later, the net effect of recording the beginning inventory at a book value of $3,000 below cost and the ending inventory at a book value of $2,000 below cost is to make cost of goods sold $1,000 lower than it otherwise would be. Therefore, the company reduces the Allowance account by $1,000 and recognizes a Loss Recovery of $1,000. These losses and recoveries are shown as adjustments to cost of goods sold (as in the example in Example 9-4) and therefore disclose more information than the direct method. However, many companies may combine the two amounts in their published financial statements by reporting just the net amount of the inventory and a single amount for the cost of goods sold.

LCM: Perpetual

If the company was using a perpetual inventory system instead of a periodic system, the net results would again be the same. The journal entries to record the reductions to market would be as follows:

	Direct Method		Allowance Method	
	2007	2008	2007	2008
Cost of Goods Sold	3,000	2,000		
Inventory	3,000	2,000		
Loss (Loss Recovery) due to Market Valuation			3,000	1,000
Allowance to Reduce Inventory to Market			3,000	1,000

If the company was using the *direct* method, it would recognize the reduction of $3,000 in the 2007 ending inventory by increasing cost of goods sold and reducing inventory. In 2008 it recognizes the reduction of $2,000 in the ending inventory in exactly the same way. Again note that the net effect of the reduction of the beginning and ending inventory ($3,000 and $2,000, respectively) on cost of goods sold in 2008 is that it is $1,000 lower than it would otherwise be. If the company was using the *allowance* method, the amount it records in the Allowance and in the Loss (or Loss Recovery) accounts is the same as for the periodic method.

LCM: Reporting

We show the financial statement reporting of the direct and allowance methods for the periodic inventory method in Example 9-4, assuming purchases in each year are $100,000. The advantage of the allowance method is that it clearly discloses the loss and loss recovery in the company's income statements (but not as extraordinary items) and the valuation adjustment in its respective balance sheets. Although this method is recommended and is used for many companies' internal financial reporting, published financial statements generally do not disclose the size of the loss and the valuation allowance (unless one, or both, is material) but merely disclose that the company is using the lower of cost or market method.

EXAMPLE 9-4 **Financial Statement Reporting of the Lower of Cost or Market (LCM) Method**

Direct Method
Income Statement

	2007		2008	
Beginning inventory	$ 20,000	(cost)	$ 22,000	(LCM)
Purchases	100,000		100,000	
Cost of goods available	$120,000		$122,000	
Less: Ending inventory	(22,000)	(LCM)	(28,000)	(LCM)
Cost of goods sold	$ 98,000		$ 94,000	

Balance Sheet

	12/31/2007	12/31/2008
Inventory at lower cost or market	$ 22,000	$ 28,000

Allowance Method
Income Statement

	2007		2008	
Beginning inventory	$ 20,000	(cost)	$ 25,000	(cost)
Purchases	100,000		100,000	
Cost of goods available	$120,000		$125,000	
Less: Ending inventory	(25,000)	(cost)	(30,000)	(cost)
	$ 95,000		$ 95,000	
Loss (recovery) due to market decline (recovery)	3,000		(1,000)	
Cost of goods sold	$ 98,000		$ 94,000	

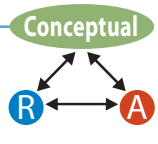
Balance Sheet

	12/31/2007	12/31/2008
Inventory at cost	$ 25,000	$ 30,000
Less: Allowance to reduce inventory to market	(3,000)	(2,000)
Inventory at lower of cost or market	$ 22,000	$ 28,000

Lower of Cost or Market and Interim Financial Statements

APB Opinion No. 28 specifies that if a company experiences a temporary market decline in an interim period the company should ignore the decline in its interim financial statements. If the company is unlikely to recover the decline, it should recognize the amount. If the company recognizes a decline and then reverses it in a later *interim* period, it should recognize a loss recovery and increase the inventory value by the amount of the recovery, but only up to the original cost.[4]

Conceptual Evaluation of Lower of Cost or Market



The reduction of the value of the inventory to market and the recognition of a loss are appropriate for both a company's balance sheet and income statement. As we discussed in Chapter 4, *FASB Statement of Concepts No. 6* defines *assets* as "probable future economic benefits." When the cost of the inventory exceeds the expected benefits, the lower market value is a better

4. "Interim Financial Reporting," *APB Opinion No. 28* (New York: AICPA, 1973), par. 14(c).

2 Explain the conceptual issues regarding the lower of cost or market method.

measure of the expected benefits. In other words, an unrecoverable cost is not an asset. As we discussed in Chapter 5, the *Statement* also defines *losses* as "decreases in net assets from peripheral or incidental transactions . . . and other events . . . except those that result from expenses or distributions to owners." Thus a company should recognize the decline in value of the inventory as a reduction in the income of the period in which the loss occurs.

Although the lower of cost or market method is applied to all cost flow assumptions, it is unlikely that it will be used with LIFO because the replacement cost should not be less than the LIFO cost. Such a situation would be very unusual, especially since LIFO is used when there is an expectation of rising costs.

A major criticism of the lower of cost or market rule is that it is applied only in one direction. Declines and (holding) losses are recognized but increases and (holding) gains are not. Obviously this is inconsistent, but it is justified by the conservatism (prudence) convention. Conservatism requires a company to recognize all losses that it can reasonably expect and to anticipate no possible gains, which is what the lower of cost or market rule achieves. Some users argue that the market value of inventory should be recognized when the replacement cost is *higher* than the historical cost. They argue that the replacement cost of the inventory is *reliable* regardless of its relationship to historical cost. Furthermore, they argue that the valuation of inventory at replacement cost (when higher than historical cost) is *relevant* because it better reflects the **cash flow potential** of the inventory and enhances the predictive value of the information. This valuation, however, is not allowed under generally accepted accounting principles, because it would be a violation of the historical cost principle.

It could be argued that another principle, the *revenue recognition* principle, is violated by the lower of cost or market method. This is because a loss is recognized before the earning process is complete and before an exchange transaction has occurred. Modification of the revenue recognition principle is justified in these circumstances because the decline in the value of the company's inventory is an **economic event of the period** that has caused a reduction in its stockholders' equity. Therefore the loss should be included in the determination of income. However, the revenue recognition principle may be used to support the nonrecognition of increases in value, because the total difference between selling price and cost is usually recognized in the period of the sale. Also, recognition of an increase in the value of the inventory would require the recognition of income and would be a violation of the revenue recognition principle.

Since a company recognizes a loss in the period of the market decline, its income will be *higher* in the subsequent period when the inventory is sold than it would otherwise have been. In other words, the loss is transferred from the future period of the sale to the current period of the decline in market value. Total income over the two periods will be the same whether or not the lower of cost or market rule is used. This is shown by the earlier

Credit: ©Getty Images/PhotoDisc

example in which recording the inventory at the lower of cost or market caused income to be lower by $3,000 in 2007 and higher by $1,000 in 2008. If the company recorded the inventory at cost in a subsequent year(s), its income will be higher by the $2,000 remaining in the Allowance account in that year(s). Therefore the company's total income over the years in which it recorded inventory at lower of cost or market will be the same as if it had recorded the inventory at cost for those years. This occurs because the beginning and ending inventory for the several years are both at cost.

Link to Ethical Dilemma

Your company, Acquirer Inc., has recently acquired a related business, TargetCo, to take advantage of possible synergies. You have been appointed CFO of TargetCo and hope to restore it to profitability. You realize that this will not be an easy task and that this opportunity will make or break your career. One of your first priorities is for your staff to conduct an extensive review of the value of TargetCo's inventory. The resulting review determines that approximately 10% of the inventory should be written down under the lower of cost or market rule. However, to be conservative, you authorize a 25% reduction in the inventory valuation that you term a restructuring charge. Discuss the ethical implications.

Link to International Differences

International accounting standards also require the use of the lower of cost or market method. However, market is defined as net realizable value and should typically be applied to individual items. International accounting standards also allow a reversal of a write-down and require disclosures about inventory that is written down, as well as any reversals.

Purchase Obligations and Product Financing Arrangements

Accounting principles generally require that a company not record a purchase obligation in its accounts (except in governmental accounting), because neither an asset nor a liability is created by placing an order. **If a company has incurred an unconditional purchase obligation at a definite price, the company discloses this commitment in a note to its financial statements.**[5] This disclosure is required because the commitment is important for the prediction of the cash outflows that the company will make in the future.

If a company has an unconditional (noncancelable) purchase obligation to acquire inventory and the current market price (i.e., replacement cost) is less than the fixed purchase price, the company must recognize the loss in the period in which the decline occurs. This procedure is consistent with the conservatism principle and also

3 Understand purchase obligations and product financing arrangements.

5. "Disclosure of Long-Term Obligations," *FASB Statement of Financial Accounting Standards No. 47* (Stamford, Conn.: FASB, 1981), par. 7.

provides the users of the financial statements with information about the decision-making ability of the management. For example, if a company entered into a noncancelable commitment to purchase inventory at a fixed price of $500,000 and the market price (replacement cost) at the end of the year is $450,000, it would make the following year-end adjusting entry:

Loss on Purchase Commitments	50,000	
Accrued Loss on Purchase Commitments		50,000

The company reports the accrued loss as a liability on its year-end balance sheet.

The company writes it off the accrued loss when it purchases the goods as follows:

Inventory (or Purchases)	450,000	
Accrued Loss on Purchase Commitments	50,000	
Accounts Payable		500,000

If the market price rises by the time the company makes the purchase, it reduces the accrued loss and recognizes a loss recovery. It then records the purchases at the market price (cost) on the date of acquisition.

The company accrues the loss only when there is a loss on a *noncancelable* purchase commitment. Such a loss is a contingent loss and is recognized because it is probable and can be reasonably estimated, as we discussed in Chapter 4. Losses on *cancelable* purchase commitments are not accrued because it is assumed that the purchase commitment can be canceled and the loss avoided.

Some companies have engaged in product financing arrangements as a way of financing the cost of inventory before the sale to the ultimate purchaser occurs. **In a product financing arrangement the company "sells" the inventory to another company. Then, in a related transaction, it agrees to purchase the inventory (or a substantially identical item) back from the other company at specified prices over specified periods.** Typically the inventory is not delivered to the "buyer" and is repurchased at a higher price, the difference being an interest charge. When the "sale" under the product financing arrangement occurs, the transaction is similar to borrowing cash with the inventory being used as collateral, sometimes referred to as a "parking" transaction. Thus, according to **FASB Statement No. 49,** the company does *not* record sales revenue but instead records the proceeds received as a liability.[6] This procedure avoids the overstatement of revenues and stockholders' equity and the understatement of liabilities. As a result of not recording a sale, the inventory also remains in the accounts at cost. Note, however, that this *Statement* does *not* apply to agreements to repurchase at prices that are not specified.

Valuation Above Cost

4 Explain the valuation of inventory above cost.

We stated earlier in this chapter that the lower of cost or market method does not result in a valuation of inventory above cost. However, generally accepted accounting principles do allow a company to value its inventory above cost in certain circumstances. **Accounting Research Bulletin No. 43** states that in exceptional cases inventories may be reported above cost. For example, precious metals having a fixed monetary value with no major cost of marketing may be reported above cost. Any other exceptions must be justified by an inability to determine appropriate costs, immediate marketability at a quoted market price, and unit interchangeability. When goods are reported above cost, this fact should be fully disclosed. Inventories of agricultural, mineral, and other products, where

6. "Accounting for Product Financing Arrangements," *FASB Statement of Financial Accounting Standards No. 49* (Stamford, Conn.: FASB, 1981).

units are interchangeable and are immediately marketable at quoted prices, and for which appropriate costs may be difficult to obtain may also be reported above cost.[7]

Real Report 9-1 shows an example of valuation at market prices for **ConAgra Foods**. Justification for this method exists when it is highly certain that the inventory can be sold at the market price. Such a situation indicates that the income is earned by production rather than by sale. Therefore, valuation at market, above cost, is appropriate. However, this practice violates the conservatism principle and the usual application of the revenue recognition principle, and is acceptable only in selected industries.

Real Report 9-1 Inventory Valuation Above Cost

ConAgra Foods

NOTE 1: Summary of Significant Accounting Policies (in part):

Inventories Grain, flour, and major feed ingredient inventories are hedged to the extent practicable and are principally stated at market, including adjustment to market of open contracts for purchases and sales.

NOTE 9: Senior Long-Term Debt, Subordinated Debt and Loan Agreements

Interest expense incurred to finance hedged inventories has been charged to cost of goods sold.

Question:

1. What allows ConAgra to value its inventory at market price instead of cost?

Secure Your Knowledge 9-1

- The lower of cost or market (LCM) rule is an application of the conservatism principle that requires a company to write down its inventory to market value when the market value of the inventory has declined below its historical cost.
- In applying the LCM method, market value is defined as the current replacement cost; it is constrained by the net realizable value (ceiling) and the net realizable value less a normal profit margin (floor).
- LCM may be applied to individual inventory items (the most conservative approach), to major categories of inventory items, or to the entire inventory.
- The write-down of inventory cost under the LCM method can be accomplished by recording the write-down using either the:
  - direct method (recorded directly in the inventory and cost of goods sold accounts) or
  - indirect method (recorded in an inventory valuation/allowance account and a loss account).
- Unconditional purchase obligations should generally be disclosed in a note to the financial statements; however, if the market price is less than the fixed purchase price, a loss should be recognized in the period of the decline.
- Product financing arrangements are similar to borrowing cash with inventory as collateral; therefore, a liability is recorded for the proceeds of the transaction.

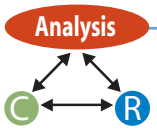
7. *Accounting Research Bulletin No. 43, op. cit.*, ch. 4, par. 15 and 16.

Gross Profit Method

5 Use the gross profit method.

Two commonly used methods of estimating inventory costs are (1) the gross profit method and (2) the retail inventory method (which we discuss in the next section).

A company uses the gross profit method to estimate the cost of the inventory by applying a gross profit rate from previous period(s) to the net sales of the current period. It may be used in the following situations:



1. To determine the cost of the inventory at the end of an interim period without taking a physical count. Because of the cost of taking a physical inventory, a company using a periodic inventory system may use the gross profit method for its internal financial statements. It is also an acceptable method for interim financial statements, provided that the company "disclose the method used at the interim date and any significant adjustments that result from reconciliations with the annual physical inventory."[8]
2. For the internal or external auditor to check the reasonableness of an inventory cost developed from a physical inventory or perpetual inventory system. Also, the auditor can take a physical inventory count before the end of the year and then estimate the cost of the ending inventory.
3. To estimate the cost of inventory that is destroyed by a casualty, such as a fire.
4. To estimate the cost of the inventory from incomplete records. For example, if a company's inventory records are destroyed, the inventory can be estimated if the cost of goods available for sale and the sales are known or can be reconstructed.
5. To develop a budget of cost of goods sold and ending inventory from a sales budget.

The gross profit method assumes that a company's gross profit rate (the rate of gross profit on net sales from the company's income statement) in the current period is not materially different from that of the previous period(s). If there are any identifiable differences, adjustments should be made, as we discuss later. The steps that a company completes when using the gross profit method include the following:

1. Calculate the historical gross profit rate by dividing the gross profit of the prior period(s) by the net sales of the prior period(s).
2. Estimate the gross profit for the current period by multiplying the historical gross profit rate by the actual net sales for the period.
3. Subtract the estimated gross profit from the actual net sales to determine the estimated cost of goods sold for the period.
4. Subtract the estimated cost of goods sold from the actual cost of goods available for sale (the beginning inventory plus the net purchases) for the period to determine the estimated cost of the ending inventory.

Example: Gross Profit Method

We show how a company applies the gross profit method in Example 9-5 and list each of the preceding steps in parentheses. The company uses the historical gross profit rate of 40% because it believes this rate is the best estimate of conditions in the current year; that is, no material changes in conditions from previous years have occurred.[9]

---

8. *APB Opinion No. 28, op. cit.*, par. 14(a).
9. Sometimes a company will express gross profit as a percent of cost of goods sold instead of as a percent of net sales. In this case it must convert the gross profit percent to a percent of net sales before it can apply the gross profit method, as follows:

$$\text{Gross Profit to Net Sales Ratio} = \frac{\text{Gross Profit to Cost of Goods Sold Ratio}}{1 + \text{Gross Profit to Cost of Goods Sold Ratio}}$$

Alternatively, if the gross profit to net sales ratio is known, and calculation of the gross profit to cost of goods sold ratio (often called the markup percentage) is required, the following formula can be used:

$$\text{Gross Profit to Cost of Goods Sold Ratio} = \frac{\text{Gross Profit to Net Sales Ratio}}{1 - \text{Gross Profit to Net Sales Ratio}}$$

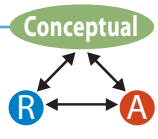
EXAMPLE 9-5 Estimating Cost of Ending Inventory by Gross Profit Method

Given Information

Beginning inventory, at cost		$ 10,000
Net purchases for the period		90,000
Net sales for the period		130,000
Estimated historical gross profit rate (on net sales)		40% (1)
Estimation of Ending Inventory		
Beginning inventory, at cost		$ 10,000
Net purchases		90,000
Cost of goods available for sale		$100,000
Less: Estimated cost of goods sold:		
Net sales	$130,000	
Gross profit rate	0.40	
Estimated gross profit	$ 52,000 (2)	
Cost of goods sold ($130,000 – $52,000)		(78,000) (3)
Estimated cost of ending inventory		$ 22,000 (4)

One step may be removed from the calculation shown in Example 9-5. Since the gross profit is 40% of net sales, the cost of goods sold is 60% of net sales. Therefore, the cost of goods sold could be calculated directly as $78,000 (60% × $130,000). ♦

Conceptual Evaluation of the Gross Profit Method



The gross profit method is useful in the situations outlined at the beginning of this section, but the relevance of the results depends on the accuracy of the gross profit percentage. Three modifications may enhance its accuracy.

First, a company should adjust the gross profit rate for known changes in the relationship between its gross profit and net sales. For example, if the company's costs of purchases have increased, but it has not passed on the increases to customers through increased sales prices, it should reduce the gross profit percentage accordingly. The company may also need to adjust the gross profit rate if its productivity or sales (and purchases) returns and allowances have changed.

Second, a company may use a separate gross profit rate for each department or type of inventory that has a different markup percentage. It would then apply separate rates to each department's net sales, and add the resulting amounts to compute the total inventory. Use of a single, overall gross profit rate assumes that all types of inventory are sold or held in inventory in equal proportions at all times. Since this is unlikely, use of separate gross profit rates enhances the accuracy of the cost of the ending inventory and the cost of goods sold.

Third, a company may use an average gross profit rate based on several past periods to average out period-to-period fluctuations. However, use of an average rate assumes that no significant changes occurred over the periods selected for calculating the average rate and that the company made no adjustments to account for such changes. The use of an average rate is particularly appropriate when there are relatively stable costs, selling prices, and operating methods.

The ending inventory estimated by the gross profit method is consistent with the cost flow assumption previously (and currently) used by the company. This occurs because the gross profit rate is based on past results developed from using the particular cost flow assumption. However, if there has been a special situation in the past, such as the reduction of the inventory to market, or a liquidation of LIFO inventory, the gross profit rate must be adjusted.

Retail Inventory Method

6 Understand the retail inventory method.

The retail inventory method is used widely to estimate the cost of inventory when there is a consistent pattern between the cost of a company's purchases and selling prices. This pattern may exist either for the whole company or for identifiable departments within the company. The method is best used by retail stores where prices often are set based on a consistent markup above cost and the accounting systems are based on retail values rather than costs. The retail inventory method can be applied based on the average, FIFO, and LIFO cost flow assumptions, and the lower of cost or market method can be used with each. The retail inventory method is widely used because it is allowed under generally accepted accounting principles and for income tax purposes.

The retail inventory method requires a company to use the following information:

1. Beginning inventory at cost and retail
2. Goods purchased at cost and retail
3. Changes in selling price resulting from additional markups and markdowns
4. Sales

Assuming that a company uses the retail inventory method with the *average* cost flow assumption, the following steps are necessary:

1. Compute the total goods available for sale (beginning inventory plus purchases) at both cost and retail value (selling price).
2. Compute a cost-to-retail ratio by dividing the cost of the goods available for sale by the retail value of the goods available for sale.
3. Compute the ending inventory at retail by subtracting the sales for the period from the retail value of the goods available for sale.
4. Compute the ending inventory at cost by multiplying the ending inventory at retail by the cost-to-retail ratio.

Example: Retail Inventory Method

We show how a company applies the retail inventory method using the following simplified data:

	Cost	Retail
Beginning inventory	$10,000	$17,000
Purchases	50,000	83,000
Sales		80,000

The ending inventory at cost is computed as follows (and we list each of the preceding steps in parentheses):

	Cost	Retail	
Beginning inventory	$ 10,000	$ 17,000	
Purchases	50,000	83,000	
Goods available for sale	$60,000	$ 100,000	(1)
Cost-to-retail ratio: $\frac{\$\ 60,000}{\$100,000} = 0.60$			(2)
Less: Sales		(80,000)	
Ending inventory at retail	$	20,000	(3)
Ending inventory at cost (0.60 x $20,000)	$12,000		(4) ♦

Retail Inventory Method Terminology

In the preceding example we assumed that the retail value of the goods available for sale is the original sales price, and that the company made no subsequent changes in retail prices. However, the typical retail store makes many changes in selling prices after setting the original price. (For the average retail food store there are likely to be hundreds of changes each week.) The following seven terms describe these changes:

1. *Markup*. The original markup from cost to the first selling price (also known as *mark-on*).
2. *Additional Markup*. An increase above the original sales price.
3. *Markup Cancellation*. A reduction in the selling price after there has been an additional markup. The markup cancellation cannot be greater than the additional markup.
4. *Net Markup*. The total additional markups less the total markup cancellations.
5. *Markdown*. A decrease below the original sales price.
6. *Markdown Cancellation*. An increase in the selling price after there has been a markdown. The markdown cancellation cannot be greater than the markdown.
7. *Net Markdown*. The total markdowns less the total markdown cancellations.

To illustrate the meaning of these terms, suppose that a company purchased an item for $6 and initially priced the item to sell for $10. The markup is $4. If the company subsequently increases the selling price to $12, there is an additional markup of $2. If it then lowers the selling price to $7, there is a markup cancellation of $2 and a markdown of $3. If the company then raises the selling price to $8, there is a markdown cancellation of $1. The net markup is zero ($2−$2), and the net markdown is $2 ($3−$1).

Application of the Retail Inventory Method

In the simplified example shown earlier, we used the average cost flow assumption. However, companies may use the retail inventory method to develop inventory valuations under four alternatives (we do not illustrate the lower of cost or market used with FIFO and LIFO):

1. *FIFO*. Exclude the cost and the retail value of the beginning inventory from the computation of the cost-to-retail ratio for the period. The ratio includes both net markups and net markdowns.
2. *Average Cost*. Include the cost and the retail value of the beginning inventory and net markups and markdowns in the cost-to-retail ratio.
3. *LIFO*. Compute separate ratios for each layer in the beginning inventory and for the purchases of the current period; include both net markups and net markdowns in the cost-to-retail ratio for the current period.
4. *Lower of Average Cost or Market*. Include the cost and retail value of the beginning inventory and net markups in the cost-to-retail ratio. Thus, the net markdowns are excluded from the computation of the cost-to-retail ratio. This method is also known as the *conventional retail* method.

We summarize the calculation of the cost-to-retail ratio of the current period for each of the alternative methods as follows:

	FIFO	Average Cost	LIFO*	Lower of Average Cost or Market
Beginning inventory	Exclude	Include	Exclude	Include
Purchases	Include	Include	Include	Include
Markups (net)	Include	Include	Include	Include
Markdowns (net)	Include	Include	Include	Exclude

*A separate cost-to-retail ratio is also computed for each layer in the beginning inventory.

Note that these alternative methods differ in the calculation of the cost-to-retail ratio. However, the net markups and markdowns *always* are added and subtracted in order to compute the retail value of the ending inventory. Also note that markups and markdowns are recorded only at *retail*. We show each of these methods in the following sections, using the data for the Thompson Company given in Example 9-6.

EXAMPLE 9-6 Thompson Company Inventory Cost and Retail Value

	Cost	Retail
Beginning inventory	$20	$ 35
Purchases	40	80
Net markups	—	5
Net markdowns	—	(10)
Goods available for sale	$60	$110
Sales		(66)
Ending inventory at retail		$ 44

Note: It is assumed that the beginning inventory is valued at a cost of $20 for all flow assumptions, although this value would be different for different cost flow assumptions because the beginning inventory for the current period is the ending inventory of the previous period.

FIFO

Under the FIFO cost flow assumption the beginning inventory is excluded from the computation of the cost-to-retail ratio for the period. The Thompson Company would compute the cost of its ending inventory as $23.45, as we show in Example 9-7.

EXAMPLE 9-7 Retail Inventory Method — FIFO

	Cost	Retail
Purchases	$40	$ 80
Net markups		5
Net markdowns		(10)
	$40	$ 75
Cost-to-retail ratio: $\frac{\$40}{\$75} = 0.533$ (for purchases)		
Beginning inventory	20	35
Goods available for sale	$60	$110
Less: Sales		(66)
Ending inventory at retail		$ 44
Ending inventory at FIFO cost (0.533 × $44)	$23.45	

Excluding the beginning inventory from the computation of the cost-to-retail ratio produces the layering effect of FIFO for cost of goods sold. Since the ending inventory cost is based only on the activities of the current period, the entire beginning inventory

is included in the cost of goods sold. Therefore the *cost of goods sold* is made up of two layers as follows:

	Cost	Retail
Beginning inventory	$20.00	$35
Purchases at retail		31
Purchases at cost ($31 × 0.533)	16.52	
	$36.52	$66

Thus the cost of goods available for sale of $60 is allocated (amounts rounded) between cost of goods sold ($36.52) and ending inventory ($23.45).[10]

Average Cost

Under the average cost flow assumption the beginning inventory and the net markups and markdowns are included in the cost-to-retail ratio. The Thompson Company would estimate the cost of its ending inventory as $24, as we show in Example 9-8.

EXAMPLE 9-8 Retail Inventory Method — Average Cost

	Cost	Retail
Beginning inventory	$20	$ 35
Purchases	40	80
Net markups		5
Net markdowns		(10)
Goods available for sale	$60	$110
Cost-to-retail ratio: $\frac{\$60}{\$110} = 0.545$		
Less: Sales		(66)
Ending inventory at retail		$ 44
Ending inventory at average cost (0.545 × $44)	$24	

There are similarities between applying this average cost flow assumption and the more general average cost method we discussed in the preceding chapter. The beginning inventory and the purchases are combined. Since the company sold at retail 60% ($66 ÷ $110) of the goods available for sale, 40% of the goods are left in ending inventory. The cost of the inventory is $24, which is 40% of the cost of the goods available for sale (40% × $60 = $24).

LIFO

Separate cost-to-retail ratios for the beginning inventory and the purchases must be calculated when the LIFO cost flow assumption is applied to the retail inventory method.

10. Note that in this example we assumed that the units sold during the period exceed the units in the beginning inventory; therefore, under FIFO the company includes the cost of the entire beginning inventory in cost of goods sold during the current period. If some of the beginning inventory still remained at the end of the period, the ending inventory would include two layers, each with its own cost-to-retail ratio.

The ratio for the purchases includes both markups and markdowns if the cost basis is used. (Remember that a company may use LIFO for income tax purposes only if it also uses LIFO for financial reporting.) The layers of inventory are accounted for by using the same principles as those discussed in Chapter 8. The Thompson Company would compute the cost of its ending inventory as $24.80, as we show in Example 9-9.

EXAMPLE 9-9 Retail Inventory Method — LIFO

	Cost	Retail
Beginning inventory	$20	$ 35
Cost-to-retail ratio: $\frac{\$20}{\$35} = 0.57$ (for beginning inventory)		
Purchases	40	80
Net markups		5
Net markdowns		(10)
		$ 75
Cost-to-retail ratio: $\frac{\$40}{\$75} = 0.533$ (for purchases)		
Goods available for sale	$60	$110
Less: Sales		(66)
Ending inventory at retail		$ 44
Ending inventory at LIFO cost:		
$35 × 0.57 (beginning inventory layer)	$20.00	
$ 9 × 0.533 (added layer)	4.80	
	$24.80	

The company had sales of $66, which left an inventory at retail of $44. This inventory consists of two layers, one of which is the base inventory at retail of $35, and the other an addition at retail of $9. Each layer is converted to cost at its own cost-to-retail ratio. Another way of looking at this example is to see that the Thompson Company sold 88% ($66 ÷ $75) of the goods purchased during the period. Therefore at cost the company sold $35.20 (88% × $40) of the purchases, leaving $4.80 ($40 − $35.20) as an added layer in inventory.

Note that in the Thompson Company example, the LIFO method does not produce the lowest ending inventory cost (in comparison to FIFO or average). The reason is that the cost-to-retail ratio for the purchases is less than the cost-to-retail ratio for the beginning inventory. This situation was caused by the large markdowns during the period, indicating the existence of falling costs. These may be caused by a decline in the prices charged by the supplier or by obsolescence due to a change in tastes or the season of the year. When costs are rising, the retail method using LIFO will produce a lower inventory cost.

If there was a decrease in inventory over the period, the ending inventory would include only of a portion of the beginning inventory, and there would be no need to compute a cost-to-retail ratio for the purchases of the current period. In more complex situations the beginning inventory would include LIFO layers, each with its own cost-to-retail ratio, and the decrease would be removed according to the general LIFO principles discussed in the preceding chapter.

Lower of Average Cost or Market

The retail inventory method can be used with lower of cost or market under either the average, FIFO, or LIFO cost flow assumptions. In all three cases, net markdowns are excluded from the cost-to-retail ratio for the period to achieve the effects of the lower of cost or market method. Because the lower of average cost or market is commonly used, we will illustrate this alternative. The calculations follow the average cost example earlier, except that the net markdowns are *excluded* from the computation of the cost-to-retail ratio. The Thompson Company would compute the value of its ending inventory as $22, as we show in Example 9-10.

EXAMPLE 9-10 Retail Inventory Method — Lower of Average Cost or Market

	Cost	Retail
Beginning inventory	$20	$ 35
Purchases	40	80
Net markups		5
	$60	$120
Cost-to-retail ratio: $\frac{\$60}{\$120} = 0.50$		
Net markdowns		(10)
Goods available for sale	$60	$110
Less: Sales		(66)
Ending inventory at retail		$ 44
Ending inventory at lower of cost or market (0.50 × $44)	$22	

Since the net markdowns are excluded from the computation of the cost-to-retail ratio, the denominator of the ratio is higher ($120 in Example 9-10 as compared to $110 in Example 9-8). Therefore, the ratio is lower (0.50 versus 0.545) and the cost of the ending inventory is lower ($22 versus $24). We discuss the assumptions for this calculation later in the chapter.

Additional Cost and Retail Adjustments

A company has to consider how to treat other costs and activities when it applies the retail inventory method. The cost of purchases includes the costs directly or indirectly incurred in bringing the items to their existing condition and location (as we discussed in Chapter 8). Two items that affect net purchases are (1) freight charges, which are added to the cost of purchases, and (2) purchases discounts taken under the gross price method, which are subtracted from the cost of purchases. These two items affect only the *cost* of purchases and not the retail amount of purchases, because it is assumed that the original markup applied to the invoice cost by the company covers such incidental items. A third item that affects net purchases is purchases returns and allowances. Once the purchases are recorded by a company at retail, any subsequent purchases returns and allowances are subtracted from *both the cost and the retail value* of the purchases so as not to distort the computation of the cost-to-retail ratio.

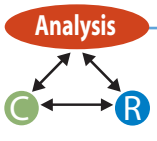
Several items also affect the estimate of the ending inventory at retail. Sales returns and allowances are subtracted from sales at retail to determine net sales. Net sales are then subtracted from goods available for sale at retail to compute ending inventory at retail. Sales discounts taken are *not* deducted to determine the ending inventory at retail, because they

are considered to be financing items and not part of the original markup. Inventory shrinkage due to breakage and theft is a common problem in retail stores. Therefore, whenever the retail inventory method is used for interim financial statements, an estimate should be made of normal shrinkage (such as 1% of sales) based on past experience. This estimate is then subtracted, in addition to the usual items, to determine the ending inventory at retail. An estimate is not necessary at year-end because a physical inventory is taken. Employee discounts—discounts from the normal sales price that are made available to employees—also are subtracted to compute ending inventory at retail (in the same way as sales). Both inventory shrinkage and employee discounts are subtracted because they are normal costs incurred by the company and therefore were reflected in the retail selling price determined by the original markup. Abnormal inventory spoilage would be subtracted at both cost and retail to determine the goods available for sale so as not to distort the cost-to-retail ratio.

Comparison of Methods

The retail inventory method is similar to the gross profit method because it estimates inventory based on a profit percentage. It differs, however, and is more sensitive to price changes because it uses a current-period estimate of the profit percentage, whereas the gross profit method uses an estimate based on past periods. This similarity is summarized as follows:

Gross Profit Method	Retail Inventory Method
Beginning inventory at cost	Beginning inventory at retail
+ Purchases at cost	+ Purchases at retail
= Cost of goods available	= Retail value of goods available
− Cost of goods sold	− Retail value of goods sold (sales)
[sales × (1 − estimated gross profit rate)]	= Ending inventory at retail
	× actual cost-to-retail ratio
= Ending inventory at cost	= Ending inventory at cost



The major advantages of the retail inventory method are:

1. It allows a company to prepare interim reports without taking a physical inventory; but as with any inventory system, the company should take a physical count at least annually.
2. It simplifies a company's record-keeping procedures because the company does not need to keep track of the costs of *individual* purchases and does not have to relate them to the particular units in inventory. In addition, retail stores typically price and display merchandise immediately, and base their record keeping on retail prices.
3. It speeds up verifying a company's ending inventory by physical count because the company records the inventory in the retail store at retail values and can therefore compare it directly with the accounting records, which are also based on retail prices. Thus, the company does not need to refer to the individual purchase invoices to determine the cost of each item.

Conceptual Evaluation of the Retail Inventory Method

7 Explain the conceptual issues regarding the retail inventory method.

Two general assumptions underlie the retail inventory method. The first is that the items in a company's inventory are sufficiently homogeneous so that all have the same markup. Or, if they have different markups, that the proportion of the different items in the ending inventory is the same as that in the goods available for sale. The company can reduce the limitations of this assumption by using a separate cost-to-retail ratio for each category of inventory or for each department. The second general assumption is that the cost-to-retail

ratio remains constant over the accounting period or that changes in the retail prices parallel the changes in the costs of purchases. The limitations of this assumption can also be reduced by weighting the different cost-to-retail ratios by the volume of activity for inventory items under each ratio.

Since the lower of average cost or market method is the most used version of the retail inventory method, it is important to consider whether this method actually does result in an inventory at lower of cost or market, or just a value that is lower than cost. We evaluate this in the three examples of Example 9-11, which use the same basic information for the Thompson Company.

EXAMPLE 9-11 Assumptions Underlying the Use of the Retail Inventory Method: Lower of Average Cost or Market

	Example 1 (no markdowns)		Example 2 (no markups)		Example 3 (all markdowns sold)	
	Cost	Retail	Cost	Retail	Cost	Retail
Beginning inventory	$20	$ 35	$20	$ 35	$20	$ 35
Purchases	40	80	40	80	40	80
Net markups		5		—		5
	$60	$120	$60	$115	$60	$120
Cost-to-retail ratio:		0.50[1]		0.52[2]		0.50[3]
Net markdowns		—		(10)		(10)
Goods available for sale	$60	$120	$60	$105	$60	$110
Less: Sales		(72)[4]		(63)[5]		(62)[6]
Ending inventory at retail		$ 48		$ 42		$ 48
Ending inventory at lower of cost or market	$24[7]		$21.91[8]		$24[9]	

[1] $\frac{\$60}{\$120} = 0.50$ [2] $\frac{\$60}{\$115} = 0.52$ [3] $\frac{\$60}{\$120} = 0.50$ [4] ($120 × 60%) [5] ($105 × 60%)

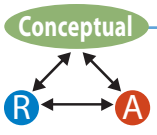
[6] ($120 × 60% − $10) [7] $\frac{\$60}{\$120} \times \$48$ [8] $\frac{\$60}{\$115} \times \$42$ [9] $\frac{\$60}{\$120} \times \$48$

In all three examples we assume that the company sells 60% of the goods available for sale, but we use different assumptions regarding the markups and markdowns in each example. In the first example we assume that there are only markups and no markdowns. Thus, the cost-to-retail ratio is $60 ÷ $120 and the ending inventory is $24. This cost is the same as the average cost figure computed in Example 9-8. Since there were no markdowns, it can be assumed that the market value has not declined below cost, and therefore the inventory value is the lower of cost or market.

In the second example we assume that there are no markups but that there are markdowns. This results in a cost-to-retail ratio of $60 ÷ $115 and an ending inventory of $21.91. Since there are markdowns of $10, it can be assumed that prices have declined by a factor of 10 ÷ 115. To reflect this change, the ending inventory is valued at the lower of cost or market, which is $21.91 [$24 − ($24 × 10 ÷ 115)]. Therefore, in this situation the method again has resulted in an inventory amount equal to the lower of cost or market.

Now refer back to the original computation of the lower of cost or market in Example 9-10. Since $22 is greater than $21.91, the $22 value is *not* the true lower of cost or market of the inventory, but simply a value that is lower than cost. This indicates that the lower of cost or market method is accurate only if the goods in the inventory are perfectly homogeneous. In other words, markups and markdowns for separate items within inventory cannot exist at the same time.

In the third example, again there are both markups and markdowns. The cost-to-retail ratio is \$60 ÷ \$120. But now we assume that all the goods that are marked down are sold. Since we also assumed that 60% of the goods available for sale are sold, sales would be equal to 60% of the goods available for sale, less the \$10 markdowns [(60% × \$120) − \$10 = \$62]. The ending inventory is \$24, which is again the lower of cost or market, because we assumed that all goods marked down have been sold and thus the ending inventory contains items that have a retail value that is higher than their cost. Therefore, for the lower of cost or market method to be accurate, the goods in inventory do not have to be perfectly homogeneous if it can be assumed that all the units that have been marked down have been sold.



To summarize, **the lower of average cost or market method is accurate only if either markups and markdowns do not exist at the same time or if all the marked-down items have been sold.** Under other conditions the method produces an inventory value that is less than cost but only approximates the lower of cost or market. We show **Wal-Mart's** disclosure of its use of the retail method in Real Report 9-2.

Real Report 9-2 Example of Inventory Disclosure

WAL-MART STORES

Balance Sheets
(in millions)

	January 31, 2004	2003
Assets (in part)		
Current Assets:		
Cash and cash equivalents	**\$ 5,199**	\$ 2,736
Receivables	**1,254**	1,569
Inventories	**26,612**	24,401
Prepaid expenses and other	**1,356**	837
Current assets of discontinued operation	**—**	1,179
Total Current Assets	**\$34,421**	\$30,722

NOTES TO FINANCIAL STATEMENTS (IN PART)

Inventories

The Company values inventories at the lower of cost or market as determined primarily by the retail method of accounting, using the last-in, first-out ("LIFO") method for substantially all domestic merchandise inventories, except SAM'S CLUB merchandise, which is based on average cost using the LIFO method. Inventories of foreign operations are primarily valued by the retail method of accounting, using the first-in, first-out ("FIFO") method. Our inventories at FIFO did not exceed inventories of LIFO by a significant amount.

Questions:

1. What method does Wal-Mart use to value its inventory? Describe how this method is applied.
2. Why do you think Wal-Mart uses the inventory method you identified in the previous question to value its inventory?
3. Why does Wal-Mart use the retail LIFO inventory method for domestic operations but the retail FIFO inventory method for international operations?

Dollar-Value LIFO Retail Method

8 Understand the dollar-value LIFO retail method.

We discussed the advantages of the dollar-value LIFO method in Chapter 8, and we discussed the advantages of the retail method earlier in this chapter. Many retail companies take advantage of both these methods by using the dollar-value LIFO retail method, which combines the principles of the retail LIFO method with the dollar-value LIFO method. Although no new principles are involved, we provide an illustration of the dollar-value retail LIFO inventory method for the Weston Company because of the complexity involved. We show the basic information in Example 9-12, and we show the calculation of the cost of the ending inventory in Example 9-13.

EXAMPLE 9-12 Weston Company Cost and Retail Values and Price Indexes

	2007		2008		2009	
	Cost	Retail	Cost	Retail	Cost	Retail
Jan. 1, inventory	$ 8,000	$12,000				
Purchases	20,400	32,000	$25,600	$41,000	$26,040	$45,000
Net markups		3,000		2,000		1,000
Net markdowns		(1,000)		(3,000)		(4,000)
Sales		(29,800)		(32,240)		(42,990)

Price Index:

Jan. 1, 2007	100
Dec. 31, 2007	108
Dec. 31, 2008	115
Dec. 31, 2009	120

Note: It is assumed that LIFO is adopted on January 1, 2007.

In Example 9-13, the cost-to-retail ratio is computed in the same manner as we described earlier for the LIFO retail method. That is, the ratio includes both net markups and net markdowns but excludes the beginning inventory. The dollar-value LIFO concepts are applied to the retail values as follows (the numbers in parentheses are from Example 9-13 for 2007):

1. The ending inventory at retail ($16,200) is computed by adding the beginning inventory, purchases, and the markups, and subtracting the markdowns and sales. Alternatively, it is computed at year-end by taking a physical inventory in which the number of units in ending inventory is multiplied by the current-year retail prices.
2. The ending inventory at retail ($16,200) is converted to base-year retail prices ($15,000) by applying the base-year conversion index:

$$\text{Ending Inventory at Base-Year Retail Prices} = \text{Ending Inventory at Retail} \times \frac{\text{Base-Year Retail Price Index}}{\text{Current-Year Price Index}}$$

   Note that the conversion index used here is based on a *price* index, while the conversion index used in Chapter 8 was based on a *cost* index. A price index is computed in the same way as a cost index, except that retail prices are used.
3. The increase (decrease) in the inventory at retail in base-year prices is computed by comparing the ending inventory with the beginning inventory when both are measured at retail in base-year prices (an increase of $3,000).

EXAMPLE 9-13 Dollar-Value LIFO Retail Inventory Method

	2007		2008		2009	
	Cost	Retail	Cost	Retail	Cost	Retail
Beginning inventory*	$ 8,000	$12,000	$ 9,944	$16,200	$14,238	$23,960
Purchases	20,400	$32,000	25,600	$41,000	26,040	$45,000
Net markups		3,000		2,000		1,000
Net markdowns		(1,000)		(3,000)		(4,000)
		34,000		40,000		42,000
Goods available for sale	$28,400	$46,000	$35,544	$56,200	$40,278	$65,960
Sales		(29,800)		(32,240)		(42,990)
Ending inventory at retail		$16,200 (1)		$23,960		$22,970
Ending inventory at retail at base-year prices:						
$16,200 × (100 ÷ 108)		$15,000 (2)				
$23,960 × (100 ÷ 115)				$20,835		
$22,970 × (100 ÷ 120)						$19,142
Inventory change at retail base-year prices:						
$15,000 − $12,000		$ 3,000 (3)				
$20,835 − $15,000				$ 5,835		
$19,142 − $20,835						$ (1,693)
Change at retail at relevant current prices:						
$3,000 × (108 ÷ 100)		$ 3,240 (4)				
$5,835 × (115 ÷ 100)				$ 6,710		
($1,693) × (115 ÷ 100)						$ (1,947)
Change at relevant current costs:*						
$3,240 × 0.60	$ 1,944 (5)					
$6,710 × 0.64			$ 4,294			
($1,947) × 0.64					$ (1,246)	
Year-end LIFO inventory:						
Base-year layer	$ 8,000		$ 8,000		$ 8,000	
Layer added in 2007	1,944		1,944		1,944	
Layer added in 2008			4,294		4,294	
Layer subtracted in 2009 at 2008 costs					(1,246)	
Ending inventory	$ 9,944 (6)		$14,238		$12,992	

*2007 cost-to-retail ratio for beginning inventory: $8,000 ÷ $12,000 = 0.667; 2007 cost-to-retail ratio for purchases: $20,400 ÷ $34,000 = 0.60; 2008 cost-to-retail ratio for purchases: $25,600 ÷ $40,000 = 0.64.

4. The increase (decrease) in the inventory at retail in base-year prices ($3,000) is converted to current-year retail prices ($3,240) by multiplying by the appropriate conversion index. If there is an *increase*, the current year conversion index is used as follows:

$$\text{Layer Increase at Current-Year Retail Prices} = \text{Increase at Base-Year Retail Prices} \times \frac{\text{Current-Year Price Index}}{\text{Base-Year Price Index}}$$

   Alternatively, if there is a *decrease*, the conversion index for the appropriate LIFO layer is used as follows:

$$\text{Decrease at Retail Prices of Most Recently Added Layer} = \text{Decrease at Base-Year Retail Prices} \times \frac{\text{Price Index of Most Recently Added Layer}}{\text{Base-Year Price Index}}$$

   Note that for large decreases that affect more than one layer of inventory, the price index applicable to each layer must be used in the conversion index.
5. The increase (decrease) at current-year retail prices is converted to cost ($1,944) by multiplying by the cost-to-retail ratio for the appropriate year. If there is an increase, the cost-to-retail ratio for the current year is used (0.60). If there is a decrease, the cost-to-retail ratio(s) for the LIFO layer(s) being removed is used.
6. The ending inventory at cost ($9,944) is computed by adding (subtracting) the increase (decrease) at cost to the beginning inventory at cost ($1,944 + $8,000).

Continuing the example, in 2008 the ending inventory at retail of $23,960 is converted to base-year retail prices of $20,835 by multiplying by the base-year conversion index (100 ÷ 115). Comparing the $20,835 to the ending inventory at retail base-year prices in 2007 of $15,000 results in an increase in inventory at base-year retail prices of $5,835. This increase is multiplied by the current-year conversion index of 115 ÷ 100 to compute the increase at current retail prices of $6,710. The $6,710 is multiplied by the cost-to-retail ratio of 0.64 to compute the $4,294 increase at current-year costs, which is added to the $9,944 ending inventory cost from 2007 to determine the $14,238 cost of the ending inventory for 2008.

In 2009 there is a *decrease* in the inventory of $1,693 at base-year retail prices. This is converted into a $1,947 decrease by applying the conversion index for 2008, since part of the layer added in 2008 is being removed. This decrease of $1,947 at retail is converted to cost by applying the cost-to-retail ratio for 2008 of 0.64, resulting in a decrease at cost of $1,246. Note that the conversion index of 115 ÷ 100 and the cost ratio of 0.64 would be used only for a reduction in inventory at base-year retail prices of $5,835, because this is the amount of the increase from 2008. The next $3,000 reduction at base-year retail prices would be at the conversion index of 108 ÷ 100 and the cost ratio of 0.60 (for the layer added in 2007) and the remaining $12,000 at a conversion index of 100 ÷ 100 and the cost ratio of 0.667 (for the beginning inventory from 2007).

Effects of Inventory Errors

9 Understand the effects of inventory errors on the financial statements.

In addition to the special methods we described earlier in the chapter, errors made by a company may affect its ending inventory valuation. Errors in the valuation of inventory and the recording of purchases can result in inaccurate values on the company's balance

sheet and income statement. We summarize the effects of some common errors in Exhibit 9-1 (assuming a periodic inventory system and ignoring income taxes):

EXHIBIT 9-1 Effects of Inventory Errors

I. A purchase on credit is omitted from both the Purchases account and ending inventory and is *not* recorded in the succeeding year.
   - **A. Current year**
     1. *Income Statement.* Income is correct because the errors in the purchases and ending inventory offset each other.
     2. *Balance Sheet.* Ending inventory and accounts payable are understated.
   - **B. Succeeding year**
     1. *Income Statement.* Income is overstated because beginning inventory is understated and therefore cost of goods sold is understated.
     2. *Balance Sheet.* Accounts payable is understated and retained earnings is overstated. Note that if the purchase omitted from the current year was included in the succeeding year, the income would be correct in the second year because the errors would again offset each other. Accounts payable and retained earnings would also be correct.

II. A purchase on credit is omitted from the Purchases account but ending inventory is correct.
   - **A. Current year**
     1. *Income Statement.* Income is overstated because purchases are understated and therefore cost of goods sold is understated.
     2. *Balance Sheet.* Accounts payable is understated because a purchase has been omitted. Retained earnings is overstated because income is overstated.
   - **B. Succeeding year**
     1. *Income Statement.* No effect because the beginning inventory, purchases, and ending inventory are correct.
     2. *Balance Sheet.* Accounts payable is understated and retained earnings is overstated, due to the error in the previous period.

III. Ending inventory is over(under)stated due to quantity and/or costing errors, but purchases are correct.
   - **A. Current year**
     1. *Income Statement.* Income is over(under)stated because cost of goods sold is under(over)stated.
     2. *Balance Sheet.* Ending inventory and retained earnings are over(under)stated.
   - **B. Succeeding year**
     1. *Income Statement.* Income is under(over)stated because beginning inventory is over(under)stated, and therefore cost of goods sold is over(under)stated.
     2. *Balance Sheet.* Correct because the errors in inventory and retained earnings in the previous year were counterbalanced in this year.

Note that in the third situation in Exhibit 9-1 the total income for the two years combined is correct, as is the ending inventory for the succeeding year. For example, assume that a company's periodic inventory at December 31, 2007 is overstated by $5,000 but purchases are correct. The following errors occur (ignoring income taxes) in the company's financial statements:

2007: *Income Statement*. Cost of goods sold is understated by $5,000 and income is overstated by $5,000.

Balance Sheet. Ending inventory and retained earnings are overstated by $5,000.

2008: *Income Statement*. Cost of goods sold is overstated by $5,000 and income is understated by $5,000.

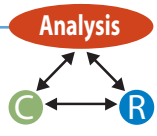
Balance Sheet. Ending inventory and retained earnings are correct because the errors have counterbalanced each other.

These errors are illustrated by the following equations:

	Beginning Inventory	+ Purchases	= Cost of Goods Sold	+ Ending Inventory
2007:	Correct	Correct	−$5,000	+$5,000
2008:	+$5,000	Correct	+$5,000	Correct

Note that if income taxes are considered, the effect of the error on income is reduced. For example, if the company has an income tax rate of 30%, the inventory is still overstated by $5,000, but net income in 2007 is overstated by only $3,500 [$5,000 × (1 − 0.30)] and income taxes payable is increased by $1,500 ($5,000 × 0.30). Thus the errors affect more items on the company's balance sheet, but the balance sheet still balances because assets are overstated by $5,000, liabilities by $1,500, and stockholders' equity by $3,500.

Many companies use a perpetual inventory system. Under this system, they still take a physical inventory and may make similar errors. The discovery of inventory errors requires careful analysis and adjusting entries to correct the company's accounts. If a company discovers a material error after it has closed the books, it treats the correction as a prior period adjustment. In this case it corrects the permanent (real) accounts. The company makes the corrections it would have made to temporary (nominal) accounts to Retained Earnings instead, as we discuss in Chapter 23.



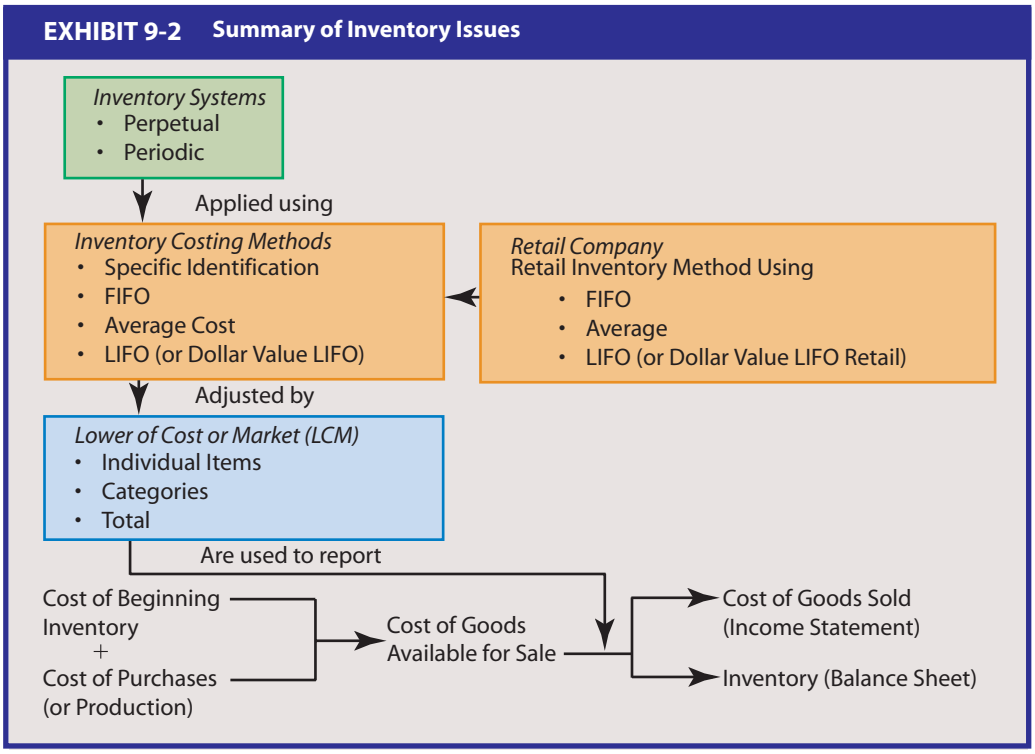
Secure Your Knowledge 9-2

- When it is impractical, infeasible, or impossible to perform a physical count of inventory, inventory estimation techniques such as the gross profit method or the retail inventory method may be used.
- The gross profit method estimates the cost of inventory by
  - Calculating a historical gross profit rate,
  - Applying this gross profit rate to the net sales of the current period to get an estimate of gross profit,
  - Subtracting the estimated gross profit from net sales to get estimated cost of goods sold, and
  - Subtracting the estimated cost of goods sold from actual cost of goods available for sale.
- The retail method is a commonly used estimation technique that can produce inventory valuations under FIFO, average cost, LIFO, or lower of average cost or market cost flow assumptions by modifying the calculation of the cost-to-retail ratio. Ending inventory is estimated by:
  - Calculating cost of goods available for sale at both cost and retail,
  - Subtracting sales from the retail value of cost of goods available for sale to obtain ending inventory at retail,
  - Computing a cost-to-retail ratio that will allow inventory valuations under FIFO, average cost, LIFO, or lower of average cost or market cost flow assumptions, and
  - Applying the appropriate cost-to-retail ratio to ending inventory at retail.
- The dollar-value LIFO retail method combines the principles of the retail LIFO method with the dollar-value LIFO method
- Errors in the valuation of inventory can result in inaccurate balance sheet and income measurements that affect multiple years. Careful analysis is required to determine the effects of such errors.

Summary of Inventory Issues

In Chapter 8 and this chapter, we discussed the inventory systems, methods, and adjustments that a company may use to account for its cost of goods sold and ending inventory. We summarize these issues in Exhibit 9-2 to help you understand their relationships.

EXHIBIT 9-2 Summary of Inventory Issues



Summary

At the beginning of the chapter, we identified several objectives you would accomplish after reading the chapter. The objectives are listed below, each followed by a brief summary of the key points in the chapter discussion.

1. **Understand the lower of cost or market method.** The lower of cost or market rule requires that a company write down its inventory to market value (replacement cost) when its utility has declined. The upper constraint on the market value is that the market value should not exceed the net realizable value. The lower constraint is that the market value should not be below the net realizable value reduced by an allowance for a normal profit margin. A company may apply the method to each item in inventory, to major categories, or to the inventory as a whole.

2. **Explain the conceptual issues regarding the lower of cost or market method.** The conceptual issues include the appropriateness of recognizing a loss and a reduction in the value of the inventory before a transaction occurs. Another issue is that a company only recognizes declines in value. The method also affects the amount of income a company recognizes in future periods.
3. **Understand purchase obligations and product financing arrangements.** If a company has incurred an unconditional purchase obligation at a definite price, the company discloses this commitment in a note to its financial statements. In a product financing arrangement, the company does not recognize the transfer of the inventory as a sale, but records the proceeds received as a liability.
4. **Explain the valuation of inventory above cost.** Inventory may be valued above cost only in rare circumstances, such as for precious metals and certain agricultural and mineral products.
5. **Use the gross profit method.** A company uses the gross profit method to estimate the cost of the inventory by applying a gross profit rate based on its income statements of previous periods to the net sales of the current period. It deducts the estimated gross profit from the actual net sales to determine the estimated cost of goods sold and deducts the latter amount from the cost of goods available for sale to determine the estimated ending inventory.
6. **Understand the retail inventory method.** Retail companies often use the retail inventory method in which they compute the ending inventory at cost by multiplying the ending inventory at retail by a cost-to-retail ratio. The computation of the cost-to-retail ratio varies depending on which cost flow assumption the company is using, and whether it is using the lower of cost or market method.
7. **Explain the conceptual issues regarding the retail inventory method.** The retail inventory method involves two assumptions. First, the items in inventory are assumed to be relatively homogeneous so that they have the same markup. Second, the cost-to-retail ratio is assumed to remain constant over the period. Furthermore, the lower of average cost or market retail method (the most widely used method) is accurate only if either markups and markdowns do not exist at the same time or if all the marked-down items have been sold.
8. **Understand the dollar-value LIFO retail method.** Under the dollar-value LIFO retail method, a company determines its ending inventory at retail and then converts this amount to the ending inventory at base-year retail prices by applying a base-year conversion index. It then determines the increase (decrease) in inventory at base-year retail prices and converts this amount to current-year retail prices using the appropriate conversion index. It converts the increase (decrease) to cost using the cost-to-retail ratio for the current year and then adds (subtracts) this amount to the beginning inventory at cost to determine the ending inventory at cost. The dollar-value LIFO retail method combines the advantages of the dollar-value LIFO method with those of the retail method.
9. **Understand the effects of inventory errors on the financial statements.** Errors in the valuation of inventory and the recording of purchases can result in inaccurate values on a company's balance sheet and income statement. The company must carefully examine each error to determine the appropriate correction.

Answers to Real Report Questions

Real Report 9-1 Answer

1. While inventory is normally valued using the lower of cost or market method, ConAgra is able to value its inventory of grain, flour, and feed ingredients at market value because of their immediate marketability at quoted prices. This represents an exception to the general rule of inventory valuation and should only be used in exceptional cases.

Real Report 9-2 Answers

1. Wal-Mart values its inventory at the lower of cost or market using the retail method. The retail inventory method requires records of beginning inventory and goods purchased to be kept at cost (Wal-Mart uses a LIFO assumption) and retail. The retail inventory method then estimates the cost of inventory by applying a cost-to-retail ratio to the ending inventory valued at retail. To achieve a lower of cost or market valuation of the ending inventory, the cost and retail value of the beginning inventory and net markups are included in the computation of the cost-to-retail ratio (net markdowns are excluded). This method is known as the conventional retail method.
2. With inventory over $26 billion, a physical count of inventory is a major undertaking. Wal-Mart most likely uses the retail method because this permits it to compute cost of goods sold and income without having to take a physical count of inventory.

3. Given rising inventory costs, Wal-Mart's use of the LIFO cost flow assumption will result in lower inventory values, earnings, and taxes (assuming the use of LIFO for tax purposes). However, LIFO is not generally allowed for tax purposes in foreign countries and with these benefits removed, the advantages of a FIFO cost flow assumption (higher income and balance sheet amounts) likely outweigh any remaining benefits of using LIFO.

QUESTIONS

Q9-1 Define the terms *cost* and *market* as used in the lower of cost or market inventory valuation rule.

Q9-2 Define the *upper* and *lower* constraints used in the lower of cost or market rule. What is the purpose of each constraint?

Q9-3 How may a company apply the lower of cost or market method to its inventory?

Q9-4 What arguments may be used against the lower of cost or market rule?

Q9-5 Under what conditions does a company anticipate price declines?

Q9-6 How, and under what conditions, does a company recognize a purchase obligation or a product financing arrangement in its financial statements?

Q9-7 What are the exceptions to historical cost valuation of inventory allowed under generally accepted accounting principles? Under what conditions is each allowed?

Q9-8 Describe four situations in which the gross profit method of estimating inventory would be useful.

Q9-9 What is the basic assumption underlying the gross profit method? How may the gross profit percentage for the prior year be modified to provide a better estimate of the inventory value?

Q9-10 What are the necessary conditions for the retail inventory method to provide valid results?

Q9-11 Explain the meaning of the following terms: *markup, additional markup, markup cancellation, net markup, markdown, markdown cancellation, net markdown.*

Q9-12 Describe how a company computes the cost-to-retail ratio for the following cost flow assumptions: FIFO, average cost, LIFO, lower of average cost or market. Why do the different methods approximate each cost flow assumption?

Q9-13 What assumptions are necessary for the lower of cost or market retail inventory method to actually produce an inventory value equal to the lower of average cost or market?

Q9-14 The retail inventory method indicated an inventory value of $80,000. A physical inventory indicated a value of $70,000. Suggest possible causes of this discrepancy.

Q9-15 Indicate the effect of each of the following errors on a company's balance sheet and income statement of the current and succeeding years:

a. The ending inventory is overstated.
b. Merchandise received was not recorded in the Purchases account until the succeeding year although the item was included in inventory of the current year.
c. Merchandise purchases shipped FOB shipping point were not recorded in either the Purchases account or the ending inventory.
d. The ending inventory was understated as a result of the exclusion of goods sent out on consignment.

MULTIPLE CHOICE (AICPA Adapted)

Select the best answer for each of the following.

M9-1 Moore Company carries product A in inventory on December 31, 2007 at its unit cost of $7.50. Because of a sharp decline in demand for the product, the selling price was reduced to $8.00 per unit. Moore's normal profit margin on product A is $1.60, disposal costs are $1.00 per unit, and the replacement cost is $5.30. Under the rule of cost or market, whichever is lower, Moore's December 31, 2007 inventory of product A should be valued at a unit cost of

a. $5.30
b. $5.40
c. $7.00
d. $7.50

M9-2 Under the retail inventory method, freight-in would be included in the calculation of the goods available for sale for which of the following?

	Cost	Retail
a.	No	No
b.	No	Yes
c.	Yes	No
d.	Yes	Yes

M9-3 The following information is available for the Silver Company for the three months ended March 31, 2007:

Merchandise inventory, January 1, 2007	$ 900,000
Purchases	3,400,000
Freight-in	200,000
Sales	4,800,000

The gross margin recorded was 25% of sales. What should be the merchandise inventory at March 31, 2007?

a. $700,000
b. $900,000
c. $1,125,000
d. $1,200,000

M9-4 The retail inventory method would include which of the following in the calculation of the goods available for sale at both cost and retail?

a. Freight-in
b. Purchases returns
c. Markups
d. Markdowns

M9-5 During 2007 R Corp., a manufacturer of chocolate candies, contracted to purchase 100,000 pounds of cocoa beans at $1.00 per pound, delivery to be made in the spring of 2008. Because a record harvest is predicted for 2008, the price per pound for cocoa beans had fallen to $.80 by December 31, 2007.

Of the following journal entries, the one that would properly reflect in 2007 the effect of the commitment of R Corp. to purchase the 100,000 pounds of cocoa is

		Debit	Credit
a.	Cocoa Inventory	100,000	
	Accounts Payable		100,000
b.	Cocoa Inventory	80,000	
	Loss on Purchase Commitments (an expense account)	20,000	
	Accounts Payable		100,000
c.	Loss on Purchase Commitments (an expense account)	20,000	
	Accrued Loss on Purchase Commitments (a liability account)		20,000
d.	No entry would be necessary in 2007.		

M9-6 The replacement cost of an inventory item is below the net realizable value and above the net realizable value less the normal profit margin. The original cost of the inventory item is above the replacement cost and below the net realizable value. As a result, under the lower of cost or market method, the inventory item should be valued at the

a. Net realizable value
b. Original cost
c. Replacement cost
d. Net realizable value less the normal profit margin

M9-7 At December 31, 2007 the following information was available from Crisford Company's books:

	Cost	Retail
Inventory, 1/1/07	$14,700	$ 20,300
Purchases	83,300	115,500
Additional markups	—	4,200
Available for sale	$98,000	$140,000

Sales for the year totaled $110,600; markdowns amounted to $1,400. Under the approximate lower of average cost or market retail method, Crisford's inventory at December 31, 2007 was

a. $30,800
b. $28,000
c. $21,560
d. $19,600

M9-8 Hestor Company's records indicate the following information:

Merchandise inventory, January 1, 2007	$ 550,000
Purchases, January 1 through December 31, 2007	2,250,000
Sales, January 1 through December 31, 2007	3,000,000

On December 31, 2007 a physical inventory determined that ending inventory of $600,000 was in the warehouse. Hestors gross profit on sales has remained constant at 30%. Hestor suspects some of the inventory may have been taken by some new employees. At December 31, 2007 what is the estimated cost of missing inventory?

a. $100,000
b. $200,000
c. $300,000
d. $700,000

M9-9 Estimates of price-level changes for specific inventories are required for which of the following inventory methods?

a. Conventional retail
b. Weighted average cost
c. FIFO
d. Dollar-value retail LIFO

M9-10 A company forgets to record a purchase on credit in the Purchases account, but ending inventory is correct. The effect of this mistake in the current year is:

	Income	Cost of goods sold	Accounts payable	Retained earnings
a.	Overstated	Understated	Understated	Overstated
b.	Understated	Overstated	Overstated	Understated
c.	Overstated	Understated	Overstated	Understated
d.	Understated	Overstated	Understated	Overstated

EXERCISES

E9-1 ***Lower of Cost or Market*** The Stiles Corporation uses the lower of cost or market method for each of two products in its ending inventory. A profit margin of 30% on the selling price is considered normal for each product. Specific data for each product are as follows:

	Product A	Product B
Historical cost	$ 68	$ 91
Replacement cost	60	93
Estimated cost of disposal	32	52
Estimated selling price	140	200

Required
What is the correct inventory value for each product?

E9-2 ***Lower of Cost or Market*** The following information for the Tuell Company is available:

	Case				
	1	2	3	4	5
Cost	$5.00	$5.00	$5.00	$5.00	$5.00
Net realizable value	5.10	5.50	4.80	4.20	4.70
Net realizable value less normal profit	4.80	5.30	4.70	4.00	4.60
Replacement cost	5.30	5.20	4.60	4.10	4.80

Required
What is the correct inventory value in each of the preceding situations?

E9-3 ***Lower of Cost or Market*** The following information is taken from the records of the Aden Company:

Product	Group	Units	Cost/Unit	Market/Unit
A	1	600	$ 1.00	$ 0.80
B	1	250	1.50	1.55
C	2	150	5.00	5.25
D	2	100	6.50	6.40
E	3	80	25.00	24.60

Required 
What is the correct inventory value if the company applies the lower of cost or market to each of the following?

1. Individual items
2. Groups of items
3. The inventory as a whole

E9-4 ***Lower of Cost or Market*** The inventories of the Berry Company for the years 2007 and 2008 are as follows:

	Cost	Market
January 1, 2007	$10,000	$10,000
December 31, 2007	13,000	11,500
December 31, 2008	15,000	14,000

Required
Prepare the necessary journal entries at the end of each year to record the correct inventory valuation. Use the allowance method and assume that a periodic inventory system is used.

E9-5 ***Loss on Purchase Commitment*** During 2007 the Boge Corporation signed a noncancelable contract to purchase 10,000 bushels of soybeans at $5 per bushel with delivery to be made in 2008. On December 31, 2007, the price of soybeans had fallen to $4.50 per bushel. On May 1, 2008, the Boge Corporation takes delivery of the soybeans when the price is $4.75 per bushel.

Required
Prepare the journal entries required on December 31, 2007 and May 1, 2008.

E9-6 ***Estimation of Fire Loss*** On September 28, 2007 a fire destroyed the entire merchandise inventory of the Carroll Corporation. The following information is available:

Sales, January 1—September 28, 2007	$540,000
Inventory, January 1, 2007	$150,000
Merchandise purchases, January 1—September 28, 2007 (including $60,000 of goods in transit on September 28, 2007, shipped FOB shipping point)	$465,000
Markup percentage on cost	20%

Required
What is the estimated inventory on September 28, 2007 immediately prior to the fire?

E9-7 AICPA Adapted ***Gross Profit Method*** On November 21, 2007 a fire at Hodge Company's warehouse caused severe damage to its entire inventory of Product Tex. Hodge estimates that all usable damaged goods can be sold for $10,000. The following information was available from Hodge's accounting records for Product Tex:

Inventory at November 1, 2007	$100,000
Purchases from November 1, 2007 to date of fire	140,000
Net sales from November 1, 2007 to date of fire	220,000

Based on recent history, Hodge had a gross margin (profit) on Product Tex of 30% of net sales.

Required
Prepare a schedule to calculate the estimated loss on the inventory in the fire, using the gross margin (profit) method. Show supporting computations in good form.

E9-8 ***Gross Profit*** The following gross profit data are taken from the financial records of the Eckhardt Company:

	2007	2008
Sales	$300,000	$296,000
Cost of goods sold	(200,000)	(203,300)
Gross profit	$100,000	$ 92,700

Required
1. If it is known that volume declined 5% from 2007 to 2008, by how much did selling prices change?
2. If it is known that volume declined 5% from 2007 to 2008, by how much did costs change?
3. If selling prices increased 4% from 2007 to 2008, what effect would this factor alone have on gross profit?
4. If costs increased by 7% from 2007 to 2008, what effect would this factor have on gross profit?

E9-9 ***Gross Profit Percentage*** An accountant sometimes must convert gross profit percentages.

Required
1. Convert the following gross profit percentages based on net sales to gross profit as a percentage of the cost of goods sold: 20%, 25%, and 40%.
2. Convert the following gross profit percentages based on the cost of goods sold to gross profit as a percentage of net sales: 20%, 25%, and 40%.

E9-10 ***Retail Inventory Method*** The Harmes Company is a clothing store that uses the retail inventory method. The following information relates to its operations during 2007:

	Cost	Retail
Inventory, January 1	$28,400	$ 40,200
Purchases	65,200	100,000
Markups (net)	—	1,900
Markdowns (net)	—	400
Sales	—	80,000

Required 
Compute the ending inventory by the retail inventory method for the following cost flow assumptions:

1. FIFO
2. Average cost
3. LIFO
4. Lower of cost or market (based on average cost)

E9-11 AICPA Adapted *Retail Inventory Method* The following data were available from the records of the Hegge Department Store for the year ended December 31, 2007:

	At Cost	At Retail
Merchandise inventory, January 1, 2007:	$ 90,000	$130,000
Purchases	330,000	460,000
Markups	—	10,000
Markdowns	—	40,000
Sales	—	480,000

Required
Using the retail method, what is the estimate of the merchandise inventory at December 31, 2007 valued at the lower of cost or market?

E9-12 *Retail Inventory Method* The following information relates to the retail inventory method used by the Jeffress Company:

	Cost	Retail
Beginning inventory	$11,160	$18,000
Purchases	54,600	92,400
Freight-in	840	—
Net markups	—	600
Net markdowns	—	1,144
Sales	—	94,056

Required
Compute the ending inventory by the retail inventory method, using the following cost flow assumptions:
1. FIFO
2. Average cost
3. LIFO
4. Lower of cost or market (based on average cost)

E9-13 *Dollar-Value LIFO Retail* The Johns Company adopts the dollar-value LIFO retail inventory method on January 1, 2007. The following information for 2007 is obtained from the company's records:

	Cost	Retail
Inventory, January 1, 2007	$20,000	$29,000
Purchases	60,000	92,000
Net markups	—	1,000
Net markdowns	—	3,000
Sales	—	75,000

The price index on January 1, 2007 was 100 and on December 31, 2007 it was 110.

Required
Compute the cost of the inventory on December 31, 2007.

E9-14 *Dollar-Value LIFO Retail* The Wyatt Company adopts the dollar-value LIFO retail inventory method on January 1, 2007. The company's records reveal that the inventory on January 1, 2007 had a cost of $75,000 and a retail value of $120,000. During 2007 the cost of purchases made was $110,000, and the retail value was $165,000. In addition, net markdowns were $6,000, net markups were $8,000, and sales were $147,000. The price index on January 1, 2007 was 100 and the index for 2004 was 110.

Required
Compute the cost of inventory on December 31, 2007. (Round the cost-to-retail index to 3 decimal places.)

E9-15 AICPA Adapted *Dollar-Value LIFO Retail* On December 31, 2006 Davison Company adopted the dollar-value LIFO retail inventory method. Inventory data for 2007 are as follows:

	LIFO Cost	Retail
Inventory, 12/31/06	$360,000	$500,000
Inventory, 12/31/07	?	660,000
Increase in price level for 2007		10%
Cost-to-retail ratio for 2007		70%

Required
Compute the cost of Davison Company's inventory at December 31, 2007.

E9-16 *Errors* A company that uses the periodic inventory system makes the following errors:

1. It omits a purchase on credit from the Purchases account and the ending inventory.
2. It omits a purchase on credit from the Purchases account, but the ending inventory is correct.
3. It overstates the ending inventory, but purchases are correct.

Required
Indicate the effect of the preceding errors on the income statement and the balance sheet of the current and succeeding years.

E9-17 AICPA Adapted *Errors* During the course of your examination of the financial statements of Burnett Co., a new client, for the year ended December 31, 2007, you discover the following:

Inventory at January 1, 2007 was understated by $6,000.
Inventory at December 31, 2007 was overstated by $5,000.

During 2007 the company received a $1,000 cash advance from a customer for merchandise to be manufactured and shipped during 2008. It had credited the $1,000 to sales revenue. The company's gross profit on sales is 50%. Net income reported on the 2007 income statement (before reflecting any adjustments for the above items) is $20,000.

Required
What is the correct net income for 2007?

PROBLEMS

P9-1 *Lower of Cost or Market* The Palmquist Company has five different inventory items that it values by the lower of cost or market method. The normal markup on all items is 20% of cost. The following information is obtained from the company's records:

Item	Units	Cost	Replacement Cost	Net Realizable Value
1	500	$10.00	$ 9.10	$ 9.20
2	400	8.00	8.10	7.80
3	300	15.00	13.50	14.00
4	200	18.00	12.00	17.00
5	100	25.00	25.50	25.30

Required 
1. Compute the lower of cost or market value for each item.
2. Compute the total inventory value if the lower of cost or market is applied to (a) each individual item and (b) the inventory as a whole. Explain the reason for the difference between the two values.

P9-2 *Lower of Cost or Market* The following are the inventories for the years 2007, 2008, and 2009 for the Parry Company:

	Cost	Market
January 1, 2007	$50,000	$50,000
December 31, 2007	64,000	60,000
December 31, 2008	71,000	70,000
December 31, 2009	75,000	78,000

Required
Prepare journal entries to record the lower of cost or market for each of the following alternatives:

1. Allowance method, periodic inventory system
2. Allowance method, perpetual inventory system
3. Direct method, periodic inventory system
4. Direct method, perpetual inventory system

P9-3 ***Lower of Cost or Market and Interim Financial Statements*** The following values were obtained from the inventory records of the Robb Company, which has a fiscal year ending on December 31:

	Cost	Market
Inventory, January 1, 2007	$10,000	$10,500
Inventory, March 31, 2007	12,000	11,500

Required

1. Under what conditions does the company ignore the decline in inventory value below cost in its interim financial statements?
2. Assuming that the company records the market value, what is the journal entry to record the decline if the company uses the perpetual inventory system and the allowance method?

P9-4 ***Lower of Cost or Market*** The inventory records of the Frost Company for the years 2007 and 2008 reveal the cost and market of the January 1, 2007 inventory to be $125,000. On December 31, 2007 the cost of inventory was $130,000, while the market value was only $128,000. The December 31, 2008 market value of inventory was $140,000, and the cost was only $135,000. The Frost Company uses a periodic inventory system. Purchases for 2007 were $100,000 and for 2008 were $110,000.

Required

1. Prepare the journal entries at the end of 2007 and 2008 to record the lower of cost or market under the (a) allowance method, and (b) direct method.
2. Prepare the cost of goods sold section of the income statement and show how the company would record the inventory on its balance sheet for 2007 and 2008 under the (a) allowance method, and (b) direct method.

P9-5 ***Gross Profit*** The following information relates to the activities of the Skeen Corporation for 2007:

Work in process, January 1	$25,000	Finished goods, December 31	$ 30,000
Work in process, December 31	40,000	Cost of production	70,000
Finished goods, January 1	37,000	Sales (net)	100,000

Required

What is the gross profit as a percentage of net sales?

P9-6 ***Estimation of Theft Loss*** You are requested by a client on September 28 to prepare an insurance claim for a theft loss which occurred on that day. You immediately take an inventory and obtain the following data:

Inventory, September 1	$38,000	Sales, September 1–September 28	$52,000
Purchases received, September 1–September 28	19,000	Sales returns	1,000

The inventory on September 28 indicates that an inventory of $15,000 remains after the theft. During the past year net sales were made at 50% above the cost of goods sold.

Required

Compute the inventory lost during the theft.

P9-7 ***Estimation of Fire Loss*** On January 20, 2008 the records of the Stewart Company revealed the following information:

Inventory, July 1, 2007	$ 53,600	Purchases discounts taken	$5,800
Purchases, July 1, 2007–January 20, 2008	368,000	Freight-in	3,800
Sales, July 1, 2007–January 20, 2008	583,000	Sales returns	6,600
Purchases returns	11,200		

A fire destroyed the entire inventory on January 20, 2008 except for purchases in transit, FOB shipping point, of $6,000 and goods having a selling price of $4,700 that were salvaged from the fire. The salvaged goods had an estimated salvage value of $2,900. The average gross profit on net sales in previous periods was 40%.

Required

1. Compute the cost of the inventory lost in the fire.
2. If a company discloses that it uses a periodic inventory system, what concerns might you have about its interim financial statements?

P9-8 ***Estimation of Loss*** On February 17, 2007 a flood destroyed the work in process inventory and half the raw materials inventory of the LRT Company. There was no damage to the finished goods inventory. A physical inventory taken after the flood indicated the following values:

Raw materials	$35,000	Finished goods	$79,000

A review of the accounting records indicated the following:

Inventories, December 31, 2006			
Raw materials	$70,000	Raw materials purchases	$20,000
Work in process	80,000	Direct labor cost	30,000
Finished goods	72,000	Manufacturing overhead cost	15,000
Sales (to February 17)	50,000	Gross profit rate (on sales)	40%

Required
Compute the value of the inventory destroyed by the flood.

P9-9 **AICPA Adapted** ***Estimation of Flood Loss*** On June 30, 2007 a flash flood damaged the warehouse and factory of Padway Corporation, completely destroying the work-in-process inventory. There was no damage to either the raw materials or finished goods inventories. A physical inventory taken after the flood revealed the following valuations:

Raw materials	$ 62,000
Work in process	-0-
Finished goods	119,000

The inventory on January 1, 2007 consisted of the following:

Raw materials	$ 30,000
Work in process	100,000
Finished goods	140,000
	$270,000

A review of the books and records disclosed that the gross profit margin historically approximated 25% of sales. The sales for the first six months of 2007 were $340,000. Raw material purchases were $115,000. Direct labor costs for this period were $80,000, and manufacturing overhead was historically applied at 50% of direct labor.

Required
Compute the value of the work-in-process inventory lost at June 30, 2007. Show supporting computations in good form.

P9-10 ***Retail Inventory Method*** The Turner Corporation uses the retail inventory method. The following information relates to 2007:

	Cost	Retail		Cost	Retail
Inventory, January 1	$ 29,000	$ 45,000	Additional markups	—	$ 50,000
Purchases (gross price)	140,000	190,000	Markup cancellations	—	10,000
Purchases discounts taken	3,000	—	Markdowns	—	15,000
Purchases returns	5,000	8,000	Markdown cancellations	—	3,000
Freight-in	20,000	—	Sales	—	190,000
Employee discounts	—	3,000			

Required
Compute the cost of the ending inventory under each of the following cost flow assumptions:

1. FIFO
2. Average cost
3. LIFO
4. Lower of cost or market (based on average cost)

P9-11 ***Comprehensive*** The EKC Company uses the retail inventory method. The following information for 2007 is available:

	Cost	Retail		Cost	Retail
Inventory, January 1	$100,000	$180,000	Markdowns	—	$ 15,000
Purchases (gross price)	320,000	600,000	Markdown cancellations	—	4,000
Purchases discounts taken	6,000	—	Sales	—	610,000
Freight-in	16,000	—	Sales returns	—	30,000
Additional markups	—	60,000	Sales discounts	—	10,000
Markup cancellations	—	12,000			

Required
Compute the cost of the ending inventory under each of the following cost flow assumptions:

1. FIFO
2. Average cost
3. LIFO
4. Lower of cost or market (based on average cost)

P9-12 **AICPA Adapted** ***Retail Inventory Method*** The Red Department Store uses the retail inventory method. Information relating to the computation of the inventory at December 31, 2007 is as follows:

	Cost	Retail		Cost	Retail
Inventory at January 1, 2007	$ 32,000	$ 80,000	Markups	—	$60,000
Sales	—	600,000	Markup cancellations	—	10,000
Purchases	270,000	590,000	Markdowns	—	25,000
Freight-in	7,600	—	Markdown cancellations	—	5,000

Estimated normal shrinkage is 2% of sales.

Required
Prepare a schedule to calculate the estimated ending inventory at the lower of average cost or market at December 31, 2007, using the retail inventory method. Show supporting computations in good form.

P9-13 ***Retail Inventory Method*** The Weber Corporation uses the retail inventory method to estimate its inventory balances. The following information is available on June 30:

	Cost	Retail		Cost	Retail
Inventory, January 1	$25,000	$ 60,000	Markdowns	—	$7,000
Purchases	75,000	180,000	Additional markups	—	3,000
Sales	—	210,000	Markdown cancellations	—	2,000
Purchases returns	2,000	5,000	Markup cancellations	—	1,000
Sales returns	—	5,000			

Required
1. Compute the inventory on June 30 using the "normal" retail inventory method (lower of average cost or market).
2. Independent of Requirement 1, assume that the June 30 inventory was $80,000 at retail and that the cost-to-retail ratio is 50%. If the price level of the inventory has risen by 5% during the period, compute the cost of the June 30 inventory under the dollar-value retail LIFO method, assuming that the company adopted the method at the beginning of the year.

P9-14 ***Dollar-Value LIFO Retail*** The following information is obtained from the records of the Burger Company, which uses the dollar-value LIFO retail method:

	2007		2008		2009	
	Cost	Retail	Cost	Retail	Cost	Retail
Purchases	$200,000	$420,000	$250,000	$550,000	$240,000	$500,000
Net markups	—	20,000	—	30,000	—	10,000
Net markdowns	—	10,000	—	40,000	—	20,000
Sales	—	400,000	—	600,000	—	450,000

The company adopted LIFO on January 1, 2007, when the cost and retail values of the inventory were $50,000 and $100,000, respectively. The following price indexes were experienced by the Burger Company:

January 1, 2007	100	December 31, 2008	115
December 31, 2007	108	December 31, 2009	120

Required
Compute the cost of the ending inventory for 2007, 2008, and 2009.

P9-15 ***Dollar-Value LIFO Retail*** Intella, Inc. adopted the dollar-value retail LIFO method on January 1, 2006. The following data apply to the 4 subsequent years:

		Cost	Retail			Cost	Retail
2006	Inventory, January 1	$40,000	$ 80,000	2008	Purchases	$117,600	$280,000
	Purchases	85,500	190,000		Sales	—	260,000
	Sales	—	200,000	2009	Purchases	147,200	320,000
2007	Purchases	92,000	230,000		Sales	—	300,000
	Sales	—	210,000				

In addition the following price indexes are available:

January 1, 2006	100	December 31, 2008	120
December 31, 2006	105	December 31, 2009	125
December 31, 2007	110		

Required

Compute the inventory at the end of each of the 4 years.

P9-16 ***Dollar-Value LIFO Retail and Fire Loss*** The Golden Company adopted the dollar-value retail LIFO method on January 1, 2007. The following information relates to the following 2 years:

	2007		2008 (through September 7)		
	Cost	**Retail**		**Cost**	**Retail**
Inventory, January 1	$ 40,000	$ 90,000	Purchases	$160,000	$350,000
Purchases	100,000	210,000	Sales	—	280,000
Sales	—	200,000	Net markups	—	40,000
Net markups	—	20,000	Net markdowns	—	70,000
Net markdowns	—	40,000			

In addition the following price indexes are available:

January 2007	100
December 2007	106
September 2008	110

On September 8, 2008 a fire destroyed the inventory except for goods in transit (properly recorded), FOB shipping point, at a cost of $8,000, and undamaged goods salvaged from the fire, which had a retail value of $10,000.

Required

Compute the cost of the inventory destroyed in the fire.

P9-17 ***Errors*** As controller of the Lerner Company, which uses a periodic inventory system, you discover the following errors in the current year:

1. Merchandise with a cost of $17,500 was properly included in the final inventory, but the purchase was not recorded until the following year.
2. Merchandise purchases are in transit under terms of FOB shipping point. They have been excluded from the inventory, but the purchase was recorded in the current year on the receipt of the invoice of $4,300.
3. Goods out on consignment have been excluded from inventory.
4. Merchandise purchases under terms FOB shipping point have been omitted from the Purchases account and the ending inventory. The purchases were recorded in the following year.
5. Goods held on consignment from Talbert Supply Co. were included in the inventory.

Required

For each error indicate the effect on the ending inventory and the net income for the current year and on the net income for the following year.

P9-18 **AICPA Adapted** ***Comprehensive*** Layne Corporation, a manufacturer of small tools, provided the following information from its accounting records for the year ended December 31, 2007:

Inventory at December 31, 2007 (based on physical count of goods in Layne's plant at cost on December 31, 2007)	$1,750,000
Accounts payable at December 31, 2007	1,200,000
Net sales (sales less sales returns)	8,500,000

Additional information is as follows:

1. Included in the physical count were tools billed to a customer FOB shipping point on December 31, 2007. These tools had a cost of $28,000 and had been billed at $35,000. The shipment was on Layne's loading dock waiting to be picked up by the common carrier.
2. Goods were in transit from a vendor to Layne on December 31, 2007. The invoice cost was $50,000, and the goods were shipped FOB shipping point on December 29, 2007.
3. Work-in-process inventory costing $20,000 was sent to an outside processor for plating on December 30, 2007.
4. Tools returned by customers and held pending inspection in the returned goods area on December 31, 2007 were not included in the physical count. On January 8, 2008 the tools costing $26,000 were inspected and returned to inventory. Credit memos totaling $40,000 were issued to the customers on the same date.

5. Tools shipped to a customer FOB destination on December 24, 2007 were in transit at December 31, 2007 and had a cost of $25,000. Upon notification of receipt by the customer on January 2, 2008, Layne issued a sales invoice for $42,000.
6. Goods, with an invoice cost of $30,000, received from a vendor at 5:00 p.m. on December 31, 2007, were recorded on a receiving report dated January 2, 2008. The goods were not included in the physical count, but the invoice was included in accounts payable at December 31, 2007.
7. Goods received from a vendor on December 24, 2007 were included in the physical count. However, the related $60,000 vendor invoice was not included in accounts payable at December 31, 2007 because the accounts payable copy of the receiving report was lost.
8. On January 4, 2008, a monthly freight bill in the amount of $4,000 was received. The bill specifically related to merchandise purchased in December 2007, one-half of which was still in the inventory at December 31, 2007. The freight charges were not included in either the inventory or in accounts payable at December 31, 2007.

Required

Prepare a schedule of adjustments as of December 31, 2007 to the initial amounts in inventory, accounts payable, and sales. Show separately the effect, if any, of each of the eight transactions on the December 31, 2007 amounts. Indicate if the transactions would have no effect on the initial amount shown.

CASES

COMMUNICATION

C9-1 Retail Inventory Method

AICPA Adapted The Sandberg Paint Company, your client, manufactures paint. The company's president, Ms. Sandberg, has decided to open a retail store to sell Sandberg paint as well as wallpaper and other supplies that it would purchase from other suppliers. She has asked you for information about the retail method of pricing inventories at the retail store.

Required

Prepare a report to the president explaining the retail method of pricing inventories. Your report should include these four points:

1. Description and accounting features of the method.
2. The conditions that may distort the results under the method.
3. A comparison of the advantages of using the retail method with those of using cost methods of inventory pricing.
4. The accounting theory underlying the treatment of net markdowns and net markups under the method.

C9-2 Gross Profit

AICPA Adapted The Shelly Corporation is an importer and wholesaler. Its merchandise is purchased from several suppliers and is warehoused by Shelly Corporation until sold to consumers.

In conducting her audit for the year ended June 30, 2007 the corporation's CPA determined that the system of internal control was good. Accordingly, she observed the physical inventory at an interim date, May 31, 2007, instead of at year-end.

The CPA obtained the following information from the general ledger:

Inventory, July 1, 2006	$ 87,500
Physical inventory, May 31, 2007	95,000
Sales for 11 months ended May 31, 2007	840,000
Sales for year ended June 30, 2007	960,000
Purchases for 11 months ended May 31, 2007 (before audit adjustments)	675,000
Purchases for year ended June 30, 2007 (before audit adjustments)	800,000

The CPA's audit disclosed the following information:

Shipments received in May and included in the physical inventory but recorded as June purchases	$7,500
Shipments received in unsalable condition and excluded from physical inventory; credit memos had not been received nor had chargebacks to vendors been recorded:	
Total at May 31, 2007	$1,000
Total at June 30, 2007 (including the May unrecorded chargebacks)	$1,500
Deposit made with vendor and charged to purchases in April 2007. Product was shipped in July 2007.	$2,000
Deposit made with vendor and charged to purchases in May 2007. Product was shipped, FOB destination, on May 28, 2007, and was included in May 31, 2007 physical inventory as goods in transit.	$5,500

Through the carelessness of the receiving department, a June shipment was damaged by rain. This shipment was later sold in June at its cost of $10,000.

Required

In audit engagements in which interim physical inventories are observed, a frequently used auditing procedure is to test the reasonableness of the year-end inventory by the application of gross profit ratios. Prepare in good form the following schedules:

1. Computation of the gross profit ratio for 11 months ended May 31, 2007.
2. Computation by the gross profit ratio method of cost of goods sold during June 2007.
3. Computation by the gross profit ratio method of June 30, 2007 inventory.

CREATIVE AND CRITICAL THINKING

C9-3 Lower of Cost or Market Method

AICPA Adapted Blaedon Co. makes ongoing design refinements to lawnmowers that are produced for it by contractors. Blaedon stores the lawnmowers in its own warehouse and sells them at list price, directly to retailers. Blaedon uses the FIFO inventory method. Approximately two-thirds of new lawnmower sales involve trade-ins. For each used lawnmower traded in and returned to Blaedon, retailers receive a $40 allowance regardless of whether the trade-in was associated with a sale of a 2007 or 2008 model. Blaedon's net realizable value on a used lawnmower averages $25.

At December 31, 2007, Blaedon's inventory of new lawnmowers includes both 2007 and 2008 models. When the 2008 model was introduced in September 2007, the list price of the remaining 2007 model lawnmowers was reduced below cost. Blaedon is experiencing rising costs.

Required

1. At December 31, 2007, how should Blaedon determine the carrying amounts assigned to its lawnmower inventory of
   a. 2008 models?
   b. 2007 models?
2. Considering only the 2008 model lawnmower, explain the impact of the FIFO cost flow assumptions on Blaedon's 2007
   a. Income statement amounts.
   b. Balance sheet amounts.

C9-4 Retail Inventory Method

AICPA Adapted Retail, Inc., sells normal brand-name household products both from its own store and on consignment through The Mall Space Company.

Required

1. Explain whether Retail, Inc., should include in its inventory normal brand-name goods purchased from its suppliers but not yet received if the terms of purchase are FOB shipping point (manufacturer's plant).
2. Explain whether Retail, Inc., should include freight-in expenditures as an inventoriable cost.
3. Retail, Inc., purchased cooking utensils for sale in the ordinary course of business three times during the current year, each time at a higher price than the previous purchase. Explain the effect on ending inventory and cost of goods sold if Retail, Inc., used the weighted-average cost method instead of the FIFO method.
4. Explain how and why Retail, Inc., will treat net markdowns when it calculates the estimated cost of ending inventory using the conventional (lower of cost or market) retail inventory method.
5. Explain what products on consignment are and how they are presented on the balance sheets of Retail, Inc., and The Mall Space Company.

C9-5 Various Inventory Issues

AICPA Adapted Diane Company, a retailer and wholesaler of national brand-name household lighting fixtures, purchases its inventories from various suppliers.

Required

1. a. What criteria are used to determine which of Diane's costs are inventoriable?
   b. Are Diane's administrative costs inventoriable? Defend your answer.
2. a. Diane uses the lower of cost or market rule for its wholesale inventories. Explain the theoretical arguments for that rule.
   b. The replacement cost of the inventories is below the net realizable value less a normal profit margin, which, in turn, is below the original cost. Explain the amount that is used to value the inventories.
3. Diane calculates the estimated cost of its ending inventories held for sale at retail using the conventional (lower of average cost or market) retail inventory method. Explain how Diane would treat the beginning inventories and net markdowns in calculating the cost ratio used to determine its ending inventories.

C9-6 LCM, Dollar-Value LIFO, and Consignments

AICPA Adapted Caddell Company, a wholesaler, purchases its inventories from various suppliers FOB destination; it incurs substantial warehousing costs. Caddell uses the dollar-value LIFO inventory cost flow method. Caddell also consigns some of its inventories to Reed Company.

Reed also has items for sale that it purchases from other wholesalers. Reed uses the lower of FIFO cost or market inventory method.

Required

1. When are the purchases from various suppliers generally included in Caddell's inventory? Why?
2. Theoretically, how should Caddell account for the warehousing costs? Why?
3. a. Explain the advantages of using the dollar-value LIFO inventory cost flow method as opposed to the conventional quantity of goods LIFO method.
   b. How does the calculation of dollar-value LIFO differ from the conventional quantity of goods method?
4. Explain how Caddell should account for the inventories consigned to Reed Company.
5. When Reed applies the lower of cost or market method, what are the ceiling and floor limits?

C9-7 Inventory Valuation Issues

AICPA Adapted Hanlon Company purchased a significant amount of raw materials inventory for a new product that it is manufacturing. Hanlon purchased insurance on these raw materials while they were in transit from the supplier.

Hanlon uses the lower of cost or market rule for these raw materials. The replacement cost of the raw materials is above the net realizable value and both are below the original cost.

Hanlon uses the average cost inventory method for these raw materials. In the last two years, each purchase has been at a lower price than the previous purchase, and the ending inventory quantity for each period has been higher than the beginning inventory quantity for that period.

Required

1. Explain the theoretically appropriate method that Hanlon should use to account for the insurance costs on the raw materials while they were in transit from the supplier.
2. a. Explain the amount at which Hanlon should report the raw materials inventory on its balance sheet.
   b. In general, explain why the lower of cost or market rule is used to report inventory.
3. Explain what would have been the effect on ending inventory and cost of goods sold had Hanlon used the LIFO inventory method instead of the average cost inventory method for the raw materials.

C9-8 Various Inventory Issues

AICPA Adapted Hudson Company, which is both a wholesaler and a retailer, purchases its inventories from various suppliers. Additional facts for Hudson's wholesale operations are as follows:

- Hudson incurs substantial warehousing costs.
- Hudson uses the lower of cost or market method.
- The replacement cost of the inventories is below the net realizable value and above the net realizable value less the normal profit margin. The original cost of the inventories is above the replacement cost and below the net realizable value.

Additional facts for Hudson's retail operations are as follows:

- Hudson determines the estimated cost of its ending inventories held for sale at retail using the conventional retail inventory method, which approximates lower of average cost or market.
- Hudson incurs substantial freight-in costs.
- Hudson has net markups and net markdowns.

Required

1. Theoretically, how should Hudson account for the warehousing costs related to its wholesale inventories? Why?
2. a. In general, explain why the lower of cost or market method is used to report inventory.
   b. At which amount should Hudson report the wholesale inventories on its balance sheet? Explain the application of the lower of cost or market method in this situation.
3. In the calculation of the cost-to-retail percentage used to determine the estimated cost of its ending retail inventories, how should Hudson treat
   a. Freight-in costs?
   b. Net markups?
   c. Net markdowns?
4. Explain why Hudson's retail inventory method approximates lower of average cost or market.

C9-9 Ethics and Retail Inventory

You are the accountant for the South-Western Division of HiValue Grocery Stores. Late in December, Kelly Cholak, the CEO of the Division stops by your office and says "I have a couple of questions. I recently received a report from the head office on the first 11 months of the year. We are not doing as well as we budgeted and they are not happy with the gross profit we have earned. But the good news is that I just got off the phone with a big supplier who has excess inventory and could sell us enough of their products to last us three months. They have offered us a great price—lower than we have paid in a couple of years. Then I remembered that you use that funny LIFO retail inventory method where you play

with such confusing numbers. Will the purchase reduce our retail ratio, or whatever you call it, so that our inventory is lower and cost of goods sold higher, because that would only make us look worse? Alternatively, I thought that we could delay this purchase until after January 1 and we might be able to have one of those LIFO liquid profits and make ourselves look good for the year's results. Give these issues some thought and let's have a drink after work today to discuss them."

Required

From financial reporting and ethical perspectives, how would you reply to Kelly?