Valuation of inventories

The sale of inventory at a price greater than total cost is the primary source of income for manufacturing and retail businesses.

Inventories are asset items held for sale in the ordinary course of business or goods that will be used or consumed in the production of goods to be sold.

A merchandising business ordinarily purchases its merchandise in a form ready for sale. It reports the cost assigned to unsold units at the end of the period as merchandise inventory. Only one inventory account, Merchandise Inventory, appears in the financial statement.

Determining inventory quantities

Perpetual inventory system: purchases and sales of goods are recorded directly in the inventory account as they occur. No purchases account is used because the purchases are debited directly to inventory.

Periodic inventory system: purchases account is used to record acquisitions. The balance in the inventory account is unchanged during the period. At the end of the accounting period, a closing entry is made which debits the inventory account for the ending inventory amount and credits the inventory account for the beginning inventory amount.

Cost of goods is determined by using the following equation:
beginning inventory + net purchases – ending inventory.

Beginning inventory	100 units at $ 6 = $ 600
Purchases	900 units at $ 6 = $5,400
Sales	600 units at $12 = $7,200
Ending inventory	400 units at $ 6 = $2,400

Entries Under Perpetual and Periodic Inventory Systems

Perpetual Inventory System			Periodic Inventory System		
Purchase merchandise for resale:					
Inventory (900 at $6)	5,400		Purchases (900 at $6)	5,400	
Accounts Payable		5,400	Accounts Payable		5,400
Record sale:					
Accounts Receivable	7,200		Accounts Receivable	7,200	
Sales (600 at $12)		7,200	Sales (600 at $12)		7,200
Cost of Goods Sold					
(600 at $6)	3,600		(No entry necessary)		
Inventory		3,600			
Closing entries:					
			Inventory (ending)	2,400	
(No entry necessary)			Cost of Goods Sold	3,600	
			Purchases		5,400
			Inventory (beginning)		600

Basic issues in inventory valuation

The valuation of inventories can be a complex process that requires determination of

1. the physical goods or items to be included in inventory
2. the cost to be included in inventory
3. the cost flow assumption to be adopted

Physical goods to be included in inventory

Purchases should be recorded when legal title to the goods passes to the buyer.

General practice, is to record acquisitions when the goods are received, because it is difficult for the buyer to determine the exact time of legal passage of title for every purchase.

Goods in transit

To determine who owns the goods in transit, the transfer of risks and rewards rule must be applied.

If the goods are shipped **f.o.b.shipping point** (f.o.b. means free on board), risks and rewards of ownership pass to the buyer when the seller delivers the goods to the common carrier (transporter) who acts as an agent for the buyer.

If the goods are shipped **f.o.b. destination** risks and rewards do not pass until the goods reach the destination.

Consigned goods

Goods out on consignment remain the property of the consignor and must be included in the consignor's inventory.

Sales with high rates of return

If a reasonable prediction of the returns can be established, then the goods should be considered sold.

Conversely, if returns are unpredictable, removal of these goods from the inventory is inappropriate.

Sales on instalment

The economic substance of the transaction is that the goods should be excluded from the seller's inventory if the percentage of bad debts can be reasonably estimated.

Cost flow assumptions: a framework for Inventory analysis

Call-Mart Inc.
Inventory Related Activities (Basic Data)

Date	Purchases	Sold or Issued	Balance
Mar. 2	2,000 @ $4.00		2,000 units
Mar. 15	6,000 @ 4.40		8,000 units
Mar. 19		4,000 units	4,000 units
Mar. 30	2,000 @ 4.50		6,000 units

The ending inventory consisted of 6,000 units. Also, the 4,000 units were sold for $10.00 each for a total sales revenue of $40,000. As there was no beginning inventory, there were 10,000 units available for sale at a total cost of $43,400.

The problem is which cost or costs should be assigned to the 6,000 units of ending inventory and the 4,000 units sold. The solution depends on what one wishes to accomplish. There are several acceptable alternative cost flow methods.

These methods are based on different assumptions and accomplish different objectives. A suggested approach to selecting a method is as follows:

1. identify possible objectives to be accomplished
2. know the different acceptable methods, their assumptions, and how they work
3. evaluate the advantages and disadvantages of the different methods for achieving the objectives

4. choose the method appropriate to the situation and the objectives to be accomplished.

Objective of inventory valuation

The following general objectives are often associated with making a decision as to which inventory cost flow method to choose;

1. to match expenses (cost of goods sold) realistically against revenue.
2. to report inventory on the balance sheet at a realistic amount.
3. to minimize income taxes.

Cost flow methods of inventory valuation

Specific identification requires identifying each item sold and each item in inventory.

This method is not always practical.

Given the data for Call-mart Inc., suppose is was determined that the 6,000 units of inventory consisted of 1,000 from the March 2 purchase, 3,000 from the March 15 purchase, and 2,000 from the March 30 purchase. Ending inventory and cost of goods sold would be determined as follow:

Specific Identification Method

Date Purchased	Units	Unit Cost	Total
Mar. 2	1,000	$4.00	$ 4,000
Mar. 15	3,000	4.40	13,200
Mar. 30	2,000	4.50	9,000
Ending inventory	6,000		$26,200

Goods available for sale (total of beginning inventory and purchases)	$43,400
Deduct ending inventory	26,200
Cost of goods sold	$17,200

Conceptually, this method is appealing because actual costs are matched against actual revenues and ending inventory is at actual costs.

The cost flow matches the physical flow of goods.

First-in, First-out (FIFO)

The **FIFO method** assigns costs to goods sold in the order in which costs were incurred, that is, the cost of the first good purchased is assumed to be the cost of the first sold.

Periodic Inventory System: FIFO Method

Date of Invoice	No. Units	Unit Cost	Total Cost
Mar. 30	2,000	$4.50	$ 9,000
Mar. 15	4,000	4.40	17,600
Ending inventory	6,000		$26,600

Cost of goods available for sale	$43,400
Deduct ending inventory	26,600
Cost of goods sold	**$16,800**

Perpetual Inventory System: FIFO Method

Date	Purchased	Sold or Issued	Balance
Mar. 2	(2,000 @ $4.00) $ 8,000		2,000 @ $4.00 $ 8,000
Mar. 15	(6,000 @ 4.40) 26,400		2,000 @ 4.00 6,000 @ 4.40 } 34,400
Mar. 19		2,000 @ $4.00 2,000 @ $4.40 } **$16,800**	4,000 @ 4.40 17,600
Mar. 30	(2,000 @ 4.50) 9,000		4,000 @ 4.40 2,000 @ 4.50 } **26,600**

When FIFO is used, the ending inventory and cost of goods for a period would be the same whether a periodic or perpetual system is employed.

An objective of FIFO is to approximate the physical flow of goods. The FIFO method very nearly represents specific identification.

At the same time it does not permit manipulation of income because the enterprise is not free to pick a certain cost to be charged as an expense.

Another advantage is that the ending inventory amount is close to its current costs.

The ending inventory amount will be composed of the cost of the most recent purchases.

The basic disadvantage of this method is that current costs are likely not matched against current revenues on the income statement. The oldest costs are charged against current revenues on the income statement, which can lead to distortions in gross profit and net income.

Average cost

The **average-cost method** prices items in the inventory on the basis of the average cost of the goods available for sale during the period.

When the periodic inventory system is used, the average cost is computed at the end of the period using the weighted-average cost method.

Periodic Inventory System: Weighted-Average Cost Method

	Date	No. Units	Unit Cost	Total Cost
Inventory	Mar. 1	—	—	—
Purchases	Mar. 2	2,000	$4.00	$ 8,000
Purchases	Mar. 15	6,000	4.40	26,400
Purchases	Mar. 30	2,000	4.50	9,000
Total goods available		10,000		$43,400

Weighted-average cost per unit $\frac{\$43,400}{10,000} = \$4.34$

Inventory in units 6,000

Ending inventory **6,000 x $4.34 = $26,040**

Cost of goods available for sale	$43,400
Deduct ending inventory	26,040
Cost of goods sold	**$17,360** (= 4,000 × $4.34)

Another **moving-average-cost method** is the moving-average cost method, which is used with perpetual inventory systems.

Perpetual Inventory System: Moving-Average Cost Method

Date	Purchased	Sold or Issued	Balance
Mar. 2	(2,000 @ $4.00) $ 8,000		(2,000 @ $4.00) $ 8,000
Mar. 15	(6,000 @ 4.40) 26,400		(8,000 @ 4.30) 34,400
Mar. 19		(4,000 @ $4.30)	
		$17,200	(4,000 @ 4.30) 17,200
Mar. 30	(2,000 @ 4.50) 9,000		(6,000 @ 4.367) **26,200**

Calculation of moving-average cost per unit:

After March 15 purchase
= Cost of units available / Units available
= [($2,000 × $4.00) + (6,000 × $4.40)] / (2,000 + 6,000)
= ($8,000 + $26,400) / 8,000
= $34,400 / 8,000
= $4.30

After March 30 purchase
= [(4,000 × $4.30) + (2,000 × $4.50)] / (4,000 + 2,000)
= $26,200 / 6,000
= $4.367

The use of the average-cost methods is usually justified on the basis of practical rather than conceptual reasons.

They are simple to apply, objective, and not as subject to income manipulation as some of the other inventory costing methods.

In comparison to the FIFO method, an average-cost method results in more recent costs being reflected in the cost of goods sold, but older costs in ending inventory.

Last-in, First-out (LIFO)

The **LIFO method** assigns costs on the assumption that the cost of the most recent purchase is the first cost to be charge to cost of goods sold.

Using the data for Call-Mart, the assumption would be made that the 4,000 units withdrawn consisted of the 2,000 units purchased on March 30 and 2,000 of the 6,000 units purchased on March 15. Therefore, the cost of the ending inventory of 6,000 units would be assumed to come from the cost of any beginning inventory and then the earliest purchases in the period.

Periodic Inventory System: LIFO Method

Date of Invoice	No. Units	Unit Cost	Total Cost
Mar. 2	2,000	$4.00	$ 8,000
Mar. 15	4,000	4.40	17,600
Ending Inventory	6,000		$25,600

Cost of goods available for sale	$43,400
Deduct ending inventory	25,600
Cost of goods sold	**$17,800**

Perpetual Inventory System: LIFO Method

Date	Purchased	Sold or Issued	Balance	
Mar. 2	(2,000 @ $4.00) $ 8,000		2,000 @ $4.00	$ 8,000
Mar. 15	(6,000 @ 4.40) 26,400		2,000 @ 4.00 6,000 @ 4.40	34,400
Mar. 19		(4,000 @ $4.40) **$17,600**	2,000 @ 4.00 2,000 @ 4.40	16,800
Mar. 30	(2,000 @ 4.50) 9,000		2,000 @ 4.00 2,000 @ 4.40 2,000 @ 4.50	**25,800**

Major advantages of LIFO

Matching. In LIFO, the more recent costs are marched against current revenues to provide what may be viewed as a more realistic measure of current earnings.

Inventory profits occur when the inventory costs matched against sales are less than the replacement cost of the inventory. The cost of goods sold therefore is perceived to be understated and profit is overstated.

By using LIFO more recent costs are matched against revenues and inventory profits are thereby reduced.

Major disadvantages of LIFO

Reduced earnings: lower profits reported under the LIFO method, relative to other methods.

Inventory understated: the inventory valuation on the balance sheet is normally outdated because the oldest costs remain in inventory.

Physical flow: LIFO does not approximate the physical flow of the items.

Not acceptable for TAX purposes.

Which method to select?

Comparative Results of FIFO, Weighted-Average and LIFO Inventory Methods: Periodic System

	Method		
	FIFO	Weighted-Average	LIFO
Partial Income Statement:			
Sales Revenue	$40,000	$40,000	$40,000
Cost of Goods Sold:			
Beginning inventory	$ –0–	$ –0–	$ –0–
Purchases	43,400	43,400	43,400
Goods Available	$43,400	$43,400	$43,400
Deduct:			
Ending Inventory	26,600	26,040	25,600
Cost of Goods Sold	16,800	17,360	17,800
Gross Profit	$23,200	$22,640	$22,200
Balance Sheet:			
Inventory	$26,600	$26,040	$25,600
Objectives:			
1. Matching	Old costs against current revenue	Average cost against current revenue	"Current" costs against current revenue*
2. Balance Sheet Valuation	"Current" costs*	Average cost	Old costs
3. Income Tax Minimization	Results in higher taxable income in periods of rising prices.	Best in Canada in periods of rising prices as results in highest cost of goods sold next to LIFO.*	Not allowed in Canada in most situations. If it were, it would be best in periods of rising prices.

*Results in a realistic accomplishment of objective relative to other methods.

Cases

(INVENTORIABLE COSTS) Peter Packrat, an inventory control specialist, is interested in better understanding the accounting for inventories. Although Peter understands the more sophisticated computer inventory control systems, he has little knowledge of how inventory cost is determined. In studying the records of Eastwood Enterprises which sells normal brand-name goods from its own store and on consignment through Sherie Inc., he asks you to answer the following questions.

Instructions

(a) Should Eastwood Enterprises include in its inventory normal brand-name goods purchased from, and sent by, its suppliers but not yet received if the terms of purchase are f.o.b. shipping point (manufacturer's plant)? Why?

(b) Should Eastwood Enterprises include freight-in expenditures for the goods in (a) as an inventory cost? Why?

(c) Eastwood Enterprises 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. What would have been the effect on ending inventory and cost of goods sold had Eastwood used the weighted-average cost method instead of the FIFO method?

(d) What are products on consignment? How should they be treated in the financial records of the consignor (Eastwood Enterprises) and the consignee (Sherie Inc.)?

(AICPA

(INVENTORIABLE COSTS) You are asked to travel to Calgary to observe and verify the inventory of the Calgary branch of one of your clients. You arrive on Thursday, December 30, and find that the inventory procedures have just been started. You see a railway car on the sidetrack at the unloading door and ask the warehouse superintendent how she plans to inventory the contents of the car. She responds: "We are not going to include the contents in the inventory."

Later in the day, you ask the bookkeeper for the invoice on the carload and the related freight bill. The invoice lists the various items, prices, and extensions of the goods in the car. You note that the carload was shipped December 24 from Montreal, f.o.b. Montreal, and that the total invoice price of the goods in the car was $34,200. The freight bill called for a payment of $1,200. Terms were net 30 days. The bookkeeper affirms the fact that this invoice is to be held for recording in January.

Instructions

(a) Does your client have a liability which should be recorded at December 31? Discuss.

(b) Prepare the journal entry or entries required to reflect any adjustment.

(c) For what possible reason(s) might your client wish to postpone recording the transaction?

Presented below is a list of items which may or may not be reported as inventory in a company's December 31 balance sheet:

1. Goods out on consignment at another company's store.
2. Goods purchased f.o.b. destination that are in transit at December 31.
3. Goods sold to another company, for which our company has signed an agreement to repurchase at a set price that covers all costs related to the inventory.
4. Goods sold where returns are unpredictable.
5. goods sold f.o.b. shipping point that are in transit at December 31.
6. Freight charges on goods purchased, but no sold.
7. Factory labour costs incurred on goods still unsold.
8. Goods sold on an instalment basis
9. Interest cost incurred for inventories that are routinely manufactured.
10. Costs incurred to advertise goods held for resale.
11. Material on hand not yet placed into production by a manufacturing firm.
12. Office supplies.

13. Goods purchased f.o.b. shipping point that are in transit at December 31.
14. Raw materials on which a manufacturing firm has started production, but which are not completely processed.
15. Goods held on consignment form another company.
16. Cost identified with units completed by a manufacturing firm, but not yet sold.
17. Goods sold f.o.b. destination that are in transit at December 31.
18. Factory supplies
19. Temporary investments in shares and bonds that will be resold in the near future.