

*Chapter 5<sup>1</sup>*

# ***Accounting for Inventories***

## **Learning Objectives**

- Identify items comprising merchandise inventory and merchandise inventory costs.
- List the four basic inventory methods or cost flow assumptions.
- Compute inventory and cost of goods sold when using a perpetual system and under cost flow assumptions: specific identification, FIFO, LIFO and weighted average.
- Identify and define the inventory method likely to result in higher cost of goods sold and lower gross margin and net income.
- Identify and define the inventory method likely to result in lower cost of goods sold and higher gross margin and net income.
- Explain which inventory method(s) are likely to benefit a firm for tax accounting purposes.
- Analyze the impact of inventory errors on current and future financial statements.
- Explain why none of the inventory cost flow assumptions alter the physical flow of inventory units.
- Compute inventory under the lower of cost or market (LCM) method of inventory valuation.
- Describe and explain the usefulness of the inventory turnover ratio.
- Describe and explain the usefulness of days' sales in inventory.
- Compute inventory and cost of goods sold when using a periodic system and under cost flow assumptions: specific identification, FIFO, LIFO and weighted average.
- Apply both retail inventory and gross profit methods to the estimation of inventory and inventory valuation.

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<sup>1</sup> Acknowledgement: An earlier version of this chapter was provided to all accounting faculty on January 29, 2015, for review notes, comments, and recommendations for improvement. Work on this text began in early 2014. The completion of this text was made possible through a spring 2015 sabbatical from West Chester University.

## Introductory Financial Accounting – Cataldo (WCU ACC201)

The West Chester Chapter of the Institute of Management Accountants hosted a joint meeting with the student chapter at West Chester University on Monday, November 17, 2014. The meeting provided a forum to introduce the Chapter's new Mentoring Program where experienced accountants provide mentoring to students. The session included "speed networking" opportunities with accountants experienced in: Public Accounting, Large Business Accounting, Big 4 Consulting, Controller-Financial Services, Small Business and Education.



Ms. Norkiewicz has 30 years' experience in private industry and public sector accounting operations, financial management and systems implementation. For the last 17 years she consulted for Deloitte Consulting, PwC and American Management Systems in various positions as project manager and financial systems expert for Oracle, PeopleSoft, Siebel and Lawson ERP implementations with private industry, DoD Intelligence Agencies, and the US Military. With her background in Federal Accounting, she conducted detailed system assessments to determine auditability and compliance with federal financial law and regulation. Ms. Norkiewicz served as an

advisor on the Plant Property & Equipment (PP&E) Sub-Committee of the Accounting and Auditing Policy Committee (AAPC) which is a permanent committee established by the Federal Accounting Standards Advisory Board (FASAB).

She has been published in *Management Accounting* (currently *Strategic Accounting*), *Corporate Controller* and has been a speaker, frequently, on Cost Management topics at programs sponsored by the American Association of Government Accountants and the Kellogg School of Business at Northwestern University. She is active in the Institute of Management Accountants (IMA). She, presently, serves as President of the West Chester PA Chapter of the IMA and, previously, served as President of the Harrisburg Chapter and Mid-Atlantic Council.

- B.S. Drexel University
- M.B.A. Shippensburg University
- Project Management Professional (PMP)
- Certified Defense Financial Manager (CDFM).



Amazon.com has received some criticism over heavy debt levels, and saw a stock price decline in 2014, from more than \$400 per share to less than \$300 per share:



Source: Yahoo!Finance on January 27, 2015.

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Inventory represents a material or significant current asset for retail and manufacturing firms (e.g., Wal-Mart and General Motors, respectively). Inventory is a less significant or material current asset or asset class for service firms (e.g., law and accounting firms). This chapter deals with alternative methods used to value inventory in the firm's balance sheet and allocate costs to the cost of goods sold section of the firm's income statement.



## Basic Inventory Classifications

Merchandise inventory includes all inventory owned and held for sale, but special attention may be required for (1) goods in transit, (2) goods held on consignment, and (3) goods that have been damaged or are obsolete:

1. Goods in transit are included in a firm's inventory, as an asset, only when ownership has passed. The inventory that is in transit is either FOB destination or FOB shipping point, where FOB is short for "freight on board."
  - FOB shipping point – ownership passes to the buyer when shipped (shipping point), included in inventory at that point in time, and the purchaser is responsible for paying the freight and related costs associated with transport.
  - FOB destination – ownership passes to the buyer when the goods arrive (destination), included in inventory at that point in time, and the seller is responsible for paying the freight and related costs associated with transport.
2. Goods held on consignment are not part of the consignee's (seller, but not owner) inventory, and remain the property or inventory of the consignor (owner) until sold. They must be excluded from the consignee's inventory, even though the consignee may have physical possession of these assets.
3. Damaged or obsolete or spoiled goods are excluded from inventory (for sale), but must be monitored to examine and manage these amounts, which should not be material or significant. They must be valued at net realizable value, which is defined as sales price less the cost of disposition. The cost of disposition can be estimated. The reduction in value is accounted for as a loss and recorded or matched to the period when the lost value occurs.

## Beginning Inventory, Ending Inventory and Cost of Goods Sold Computations

The basic formula for beginning inventory, ending inventory and cost of goods sold warrants introduction, as follows:

	Beginning Inventory	\$XX
<i>add:</i>	Purchases of Inventory	<u>\$XX</u>
<i>equals:</i>	Inventory Available for Sale during the Period	\$XX
<i>less:</i>	Ending Inventory	<u>\$XX</u>
<i>equals:</i>	Cost of Goods Sold	<u>\$XX</u>

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### **The Cost of Inventory**

Inventory is maintained in the firm's asset section of the balance sheet at cost, which is defined as cost, less discounts, plus import duties, freight, storage, insurance, and, in the case of wine and cheese, the ordinary costs of aging for sales. Some incidental costs, if immaterial or insignificant, are expensed in their own categories and not "traced" directly to inventory. This is done when the cost of this accounting process exceeds the benefits, and is completely acceptable as long as the technique is consistently applied for each period, to achieve comparability.

### **Physical Counts of Inventory**

A perpetual system of inventory accounting is updated, in real time, for each purchase and sale. However, theft, loss, damage, and human error require periodic physical counts to verify the inventory level recorded in the firm's accounting system. Some firms do this one time per year, at fiscal year-end (e.g., retailers after Christmas and after year-end sales, usually at the end of January). Others do a component every month or every quarter, to smooth the additional work flow required over the calendar and/or fiscal year.

### **Inventory and Internal Control**

Inventory may represent one of the most valuable assets, particularly for a retailer. Physical counts of inventory require internal controls, including:

1. Pre-numbered inventory tickets that must be accounted for,
2. Inventory counters (or an external service) that does not include those charged with inventory record keeping,
3. Inventory counters that verify existence, amount and quality of inventory,
4. A second count to verify the first count (or a sample of second counts), and
5. Supervision to confirm that inventory items are not double-counted.

### **Inventory Cost Flow Assumptions**

There are 4 basic inventory techniques or cost flow assumptions: (1) first-in, first-out (FIFO), (2) weighted-average (WAVG), (3) last-in, first-out (LIFO), and (4) specific identification, the last of which would be likely to be used and applied only for very costly items (e.g., real property or housing or automobiles). It is very important to understand that these "cost flow assumptions" need no bear any resemblance to actual units purchased and sold, except in the case of "specific identification," which is described below, and in the context of all 4 of the basic inventory methods or techniques.

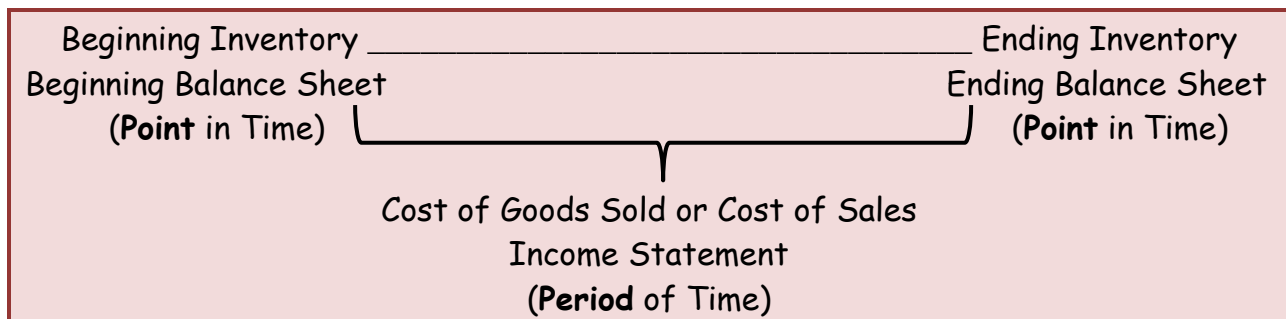
To illustrate patterns that tend to hold for the first 3 methods of inventory valuation, the below example is provided. In this case, 5 units were in beginning inventory and 5 units were purchased during the period or month. Then, 5 units were sold during the month and 5 units remained in ending inventory. Assume that this was an inflationary period, so the 5 units in beginning inventory cost only \$1.10 and the later 5 units were purchased during the period at a cost of \$1.20 per unit, as follows:

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	<u>Units</u>	<u>Unit Cost</u>	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Beginning Inventory	5	\$1.10	\$5.50	\$5.50	\$5.50
<i>add:</i> Purchases	<u>5</u>	\$1.20	<u>\$6.00</u>	<u>\$6.00</u>	<u>\$6.00</u>
<i>equals:</i> Available	10		\$11.50	\$11.50	\$11.50
<i>less:</i> Ending Inventory	<u>5</u>		<u>\$6.00</u>	<u>\$5.75</u>	<u>\$5.50</u>
<i>equals:</i> Cost of Goods Sold	<u>5</u>		<u>\$5.50</u>	<u>\$5.75</u>	<u>\$6.00</u>

The table, above, illustrates the difference between the 3 cost flow assumptions, but only for a first period of application (e.g., an initial year of a firm's operations), for simplicity. Note that the beginning Inventory, purchases, and cost of goods available for sale is the same for all cost flow assumptions.<sup>2</sup> Effectively, these different cost flow assumptions result in differences in allocations of costs between the balance sheet for ending Inventory and to the income statement for cost of goods sold, as follows:

<b>FIFO \$5.50</b>		<b>FIFO \$6.00</b>
<b>WAVG \$5.50</b>		<b>WAVG \$5.75</b>
<b>LIFO \$5.50</b>	<b>Understates Inventory in the Balance Sheet</b>	<b>LIFO \$5.50</b>



<b>FIFO \$5.50</b>
<b>WAVG \$5.75</b>
<b>Minimizes Profit by Matching Current Cost to Current Revenue LIFO \$6.00</b>

<sup>2</sup> Beginning Inventory and cost of goods available for sale would be different if this was not the first year of operations, since ending Inventory is different and ending Inventory for this period is beginning Inventory for the next or second period.

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### A Single Fact Pattern – A Perpetual Inventory System

The below will be used to illustrate the impact of an inventory cost flow assumption on a firm's selected balance sheet and income statement measures for the month of March. Assume that the firm uses the perpetual inventory system. Therefore, merchandise inventory is continuously updated to reflect merchandise inventory purchases and retail sales.

<u>Date</u>	<u>Description</u>	<u>Units &amp; Cost</u>	<u>Units &amp; Sales</u>	<u>Inventory</u>
1-Mar	Beginning Inventory	8 at \$40 = \$320		8 units
3-Mar	Purchased	12 at \$50 = \$600		20 units
8-Mar	Sold		15 at \$70	5 units
18-Mar	Purchased	18 at \$55 = \$990		23 units
25-Mar	Purchased	9 at \$57 = \$513		32 units
31-Mar	Sold		20 at \$75	12 units
	Totals	47 units	35 units	

Journal entries for all of the above transactions are summarized, below. Cost of goods sold (debits) to be matched to sales and costs to be removed from merchandise inventory (credits) are dependent on the **cost flow assumption**:

#### PURCHASES FOR MERCHANDISE INVENTORY

These amounts do not change

3-Mar	Merchandise Inventory	\$600	
	Accounts Payable		\$600

18-Mar	Merchandise Inventory	\$990	
	Accounts Payable		\$990
25-Mar	Merchandise Inventory	\$513	
	Accounts Payable		\$513

#### SALES & COST OF GOODS SOLD

Cost of Goods Sold and Merchandise Inventory measures change and/or depend on the **cost flow assumption**

8-Mar	Accounts Receivable	\$1,050	
	Sales		\$1,050
	Cost of Goods Sold	(a)?	
	Merchandise Inventory		(a)?

31-Mar	Accounts Receivable	\$1,500	
	Sales		\$1,500
	Cost of Goods Sold	(b)?	
	Merchandise Inventory		(b)?

The above fact pattern will be used to illustrate the appropriate measures to be debited to cost of goods sold and credited to merchandise inventory accounts for the (1) specific identification, (2) first-in, first-out (FIFO), (3) weighted average (WAVG), and (4) last-in, first out (LIFO) methods of inventory valuation and cost flow assumptions.



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## Specific Identification

Specific identification is frequently used to account for very expensive items that are easily and cost-effectively tracked (e.g., automobiles with vehicle identification numbers or VINs).

<u>Date</u>	<u>Description</u>	<u>Units &amp; Cost</u>	<u>Units &amp; Sales</u>	<u>Inventory</u>
1-Mar	Beginning Inventory	8 at \$40 = \$320		8 units
3-Mar	Purchased	12 at \$50 = \$600		20 units
		<i>[average cost of \$46.00]</i>		
8-Mar	Sold		15 at \$70	5 units
18-Mar	Purchased	18 at \$55 = \$990		23 units
25-Mar	Purchased	9 at \$57 = \$513		32 units
		<i>[average cost of \$54.16]</i>		
31-Mar	Sold		20 at \$75	12 units
	Totals	<u>47 units</u>	<u>35 units</u>	

Journal entries for all of the above transactions are summarized, below.

### PURCHASES FOR MERCHANDISE INVENTORY

These amounts do not change

3-Mar	Merchandise Inventory	\$600
	Accounts Payable	\$600

**Sale of 15 units →**  
**[ 5 @ \$40 & 10 @ \$50 ]**

18-Mar	Merchandise Inventory	\$990
	Accounts Payable	\$990
25-Mar	Merchandise Inventory	\$513
	Accounts Payable	\$513

**Sale of 20 units →**  
**[ 13 @ \$55 & 7 @ \$57 ]**

### SALES & COST OF GOODS SOLD

Accounts Receivable and Sales do not change. Cost of Goods Sold and Merchandise Inventory measures change and depend on the **cost flow assumption**

8-Mar	Accounts Receivable	\$1,050
	Sales	\$1,050
	Cost of Goods Sold	\$700
	Merchandise Inventory	\$700

31-Mar	Accounts Receivable	\$1,500
	Sales	\$1,500
	Cost of Goods Sold	\$1,114
	Merchandise Inventory	\$1,114



## Introductory Financial Accounting – Cataldo (WCU ACC201)

After these transactions, the Merchandise Inventory account will reflect ending Merchandising Inventory balance of \$609, as shown in T-account form, below:

<u>Merchandise Inventory</u>	
Beginning	\$320
Mar. 3	600
	Mar. 8 \$ 700
Subtotal	\$220
Mar. 18	990
Mar. 25	513
	Mar. 31 \$1,114
Ending	<u>\$609</u>

T-accounts for Sales and Cost of Goods Sold follow:

<u>Cost of Goods Sold</u>		<u>Sales</u>	
Mar. 8	\$ 700		Mar. 8 \$1,050
Mar. 31	1,114		Mar. 31 1,500
Mar.	<u>\$1,814</u>		Mar. <u>\$2,550</u>

The following are the computations and Sales, Cost of Goods Sold, and Gross Profit measures for the March 8<sup>th</sup> and March 31<sup>st</sup> sales, as well as those for both, representing sales for the entire month of March:

	(a)	(b)	Sales for the Month of March
	Sales on <u>8-Mar</u>	Sales on <u>31-Mar</u>	
Sales	\$1,050.00	\$1,500.00	\$2,550.00
<i>less:</i> Cost of Goods Sold	<u>\$700.00</u>	<u>\$1,114.00</u>	<u>\$1,814.00</u>
<i>equals:</i> Gross Profit	<u>\$350.00</u>	<u>\$386.00</u>	<u>\$736.00</u>
Beginning Inventory	\$320.00	\$220.00	\$320.00
<i>plus:</i> Purchases	<u>\$600.00</u>	<u>\$1,503.00</u>	<u>\$2,103.00</u>
<i>equals:</i> Available for Sale	\$920.00	\$1,723.00	\$2,423.00
<i>less:</i> Ending Inventory	<u>\$220.00</u>	<u>\$609.00</u>	<u>\$609.00</u>
<i>equals:</i> Cost of Goods Sold	<u>\$700.00</u>	<u>\$1,114.00</u>	<u>\$1,814.00</u>

# Introductory Financial Accounting – Cataldo (WCU ACC201)

## First-In, First-Out

First-in, first-out (FIFO) assumes that the costs that flowed into inventory, first, are to be matched to the revenues, first.

Date	Description	Units & Cost	Units & Sales	Inventory
1-Mar	Beginning Inventory	8 at \$40 = \$320		8 units
3-Mar	Purchased	12 at \$50 = \$600		20 units
		<i>[average cost of \$46.00]</i>		
8-Mar	Sold		15 at \$70	5 units
18-Mar	Purchased	18 at \$55 = \$990		23 units
25-Mar	Purchased	9 at \$57 = \$513		32 units
		<i>[average cost of \$54.78]</i>		
31-Mar	Sold		20 at \$75	<u>12 units</u>
	Totals	<u>47 units</u>	<u>35 units</u>	

On March 8, 15 units were sold (see above). Which unit costs were the first-in? Eight units at \$40 each were the first-in (see above and below).

On March 31<sup>st</sup> 20 units were sold (see above and below). Which of the remaining unit costs were the first-in? All 8 of the beginning inventory units and 7 of the March 3<sup>rd</sup> cost units were sold on March 8<sup>th</sup>. If we assume that costs flow FIFO, 5 of the 12 units purchased on March 3<sup>rd</sup> remain in inventory. Therefore, these 5 units are sold next, along with 15 of the 18 units purchased on March 18<sup>th</sup> (see above and below).

Journal entries for all of the above transactions are summarized, below.

### PURCHASES FOR MERCHANDISE INVENTORY

These amounts do not change

3-Mar	Merchandise Inventory	\$600
	Accounts Payable	\$600

**Sale of first 15 units →**  
**[8 @ \$40 & 7 @ \$50]**

18-Mar	Merchandise Inventory	\$990
	Accounts Payable	\$990
25-Mar	Merchandise Inventory	\$513
	Accounts Payable	\$513

**Sale of next 20 units →**  
**[5 @ \$50 & 15 @ \$55]**

### SALES & COST OF GOODS SOLD

Accounts Receivable and Sales do not change. Cost of Goods Sold and Merchandise Inventory measures change and depend on the **cost flow assumption**

8-Mar	Accounts Receivable	\$1,050
	Sales	\$1,050
	Cost of Goods Sold	\$670
	Merchandise Inventory	\$670

31-Mar	Accounts Receivable	\$1,500
	Sales	\$1,500
	Cost of Goods Sold	\$1,075
	Merchandise Inventory	\$1,075

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After these transactions, the Merchandise Inventory account will reflect ending Merchandising Inventory balance of \$678 (FIFO), as shown in T-account form, below:

<u>Merchandise Inventory</u>	
Beginning	\$320
Mar. 3	600
	Mar. 8 \$ 670
Subtotal	\$250
Mar. 18	990
Mar. 25	513
	Mar. 31 \$1,075
Ending	<u>\$678</u>

T-accounts for Sales and Cost of Goods Sold follow:

<u>Cost of Goods Sold</u>		<u>Sales</u>	
Mar. 8	\$ 670		Mar. 8 \$1,050
Mar. 31	1,075		Mar. 31 1,500
Mar.	<u>\$1,745</u>		Mar. <u>\$2,550</u>

The following are the computations and Sales, Cost of Goods Sold, and Gross Profit measures for the March 8<sup>th</sup> and March 31<sup>st</sup> sales, as well as those for both, representing sales for the entire month of March:

	(a)	(b)	Sales for
	Sales on	Sales on	the Month
	<u>8-Mar</u>	<u>31-Mar</u>	<u>of March</u>
<b>Sales</b>	\$1,050.00	\$1,500.00	\$2,550.00
<i>less:</i> <b>Cost of Goods Sold</b>	<u>\$670.00</u>	<u>\$1,075.00</u>	<u>\$1,745.00</u>
<i>equals:</i> <b>Gross Profit</b>	<u>\$380.00</u>	<u>\$425.00</u>	<u>\$805.00</u>
<b>Beginning Inventory</b>	\$320.00	\$250.00	\$320.00
<i>plus:</i> <b>Purchases</b>	<u>\$600.00</u>	<u>\$1,503.00</u>	<u>\$2,103.00</u>
<i>equals:</i> <b>Available for Sale</b>	\$920.00	\$1,753.00	\$2,423.00
<i>less:</i> <b>Ending Inventory</b>	<u>\$250.00</u>	<u>\$678.00</u>	<u>\$678.00</u>
<i>equals:</i> <b>Cost of Goods Sold</b>	<u>\$670.00</u>	<u>\$1,075.00</u>	<u>\$1,745.00</u>



# Introductory Financial Accounting – Cataldo (WCU ACC201)

## Weighted-Average or Moving Weighted-Average

Weighted-average (WAVG) assumes that units were sold at the average cost of inventory, which is recomputed after every purchase to match the moving weighted average cost of goods sold to sales or revenues for each sale.

<u>Date</u>	<u>Description</u>	<u>Units &amp; Cost</u>	<u>Units &amp; Sales</u>	<u>Inventory</u>
1-Mar	Beginning Inventory	8 at \$40 = \$320		8 units
3-Mar	Purchased	12 at \$50 = \$600		20 units
		<i>[average cost of \$46.00]</i>		
8-Mar	Sold		15 at \$70	5 units
18-Mar	Purchased	18 at \$55 = \$990		23 units
25-Mar	Purchased	9 at \$57 = \$513		32 units
		<i>[average cost of \$54.16]</i>		
31-Mar	Sold		20 at \$75	12 units
	Totals	<u>47 units</u>	<u>35 units</u>	

Journal entries for all of the above transactions are summarized, below.

### PURCHASES FOR MERCHANDISE INVENTORY

These amounts do not change

3-Mar	Merchandise Inventory	\$600
	Accounts Payable	\$600

**Sale of 15 units →**  
**[at \$46.00 average cost]**

18-Mar	Merchandise Inventory	\$990
	Accounts Payable	\$990
25-Mar	Merchandise Inventory	\$513
	Accounts Payable	\$513

**Sale of 20 units →**  
**[at \$54.16 average cost]**

### SALES & COST OF GOODS SOLD

Accounts Receivable and Sales do not change. Cost of Goods Sold and Merchandise Inventory measures change and depend on the **cost flow assumption**

8-Mar	Accounts Receivable	\$1,050	
	Sales		\$1,050
	Cost of Goods Sold	\$690	
	Merchandise Inventory		\$690

31-Mar	Accounts Receivable	\$1,500	
	Sales		\$1,500
	Cost of Goods Sold	\$1,083	
	Merchandise Inventory		\$1,083

## Introductory Financial Accounting – Cataldo (WCU ACC201)

After these transactions, the Merchandise Inventory account will reflect ending Merchandising Inventory balance of \$678 (FIFO - rounded), as shown in T-account form, below:

<u>Merchandise Inventory</u>	
Beginning	\$320
Mar. 3	600
	Mar. 8 \$ 690
Subtotal	\$250
Mar. 18	990
Mar. 25	513
	Mar. 31 \$1,083
Ending	<u>\$650</u>

T-accounts for Sales and Cost of Goods Sold (rounded) follow:

<u>Cost of Goods Sold</u>		<u>Sales</u>	
Mar. 8	\$ 690		Mar. 8 \$1,050
Mar. 31	1,083		Mar. 31 1,500
Mar.	<u>\$1,773</u>		Mar. <u>\$2,550</u>

The following are the computations and Sales, Cost of Goods Sold, and Gross Profit measures for the March 8<sup>th</sup> and March 31<sup>st</sup> sales, as well as those for both, representing sales for the entire month of March:

	(a)	(b)	Sales for
	Sales on	Sales on	the Month
	<u>8-Mar</u>	<u>31-Mar</u>	<u>of March</u>
Sales	\$1,050.00	\$1,500.00	\$2,550.00
<i>less:</i> Cost of Goods Sold	<u>\$690.00</u>	<u>\$1,083.08</u>	<u>\$1,773.08</u>
<i>equals:</i> Gross Profit	<u>\$360.00</u>	<u>\$416.92</u>	<u>\$776.92</u>
Beginning Inventory	\$320.00	\$230.00	\$320.00
<i>plus:</i> Purchases	<u>\$600.00</u>	<u>\$1,503.00</u>	<u>\$2,103.00</u>
<i>equals:</i> Available for Sale	\$920.00	\$1,733.00	\$2,423.00
<i>less:</i> Ending Inventory	<u>\$230.00</u>	<u>\$649.92</u>	<u>\$649.92</u>
<i>equals:</i> Cost of Goods Sold	<u>\$690.00</u>	<u>\$1,083.08</u>	<u>\$1,773.08</u>





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## Last-In, First-Out

Last-in, first-out (LIFO) assumes that the costs that flowed into inventory, first, are to be matched to the revenues, first.

Date	Description	Units & Cost	Units & Sales	Inventory
1-Mar	Beginning Inventory	8 at \$40 = \$320		8 units
3-Mar	Purchased	12 at \$50 = \$600		20 units
		<i>[average cost of \$46.00]</i>		
8-Mar	Sold		15 at \$70	5 units
18-Mar	Purchased	18 at \$55 = \$990		23 units
25-Mar	Purchased	9 at \$57 = \$513		32 units
		<i>[average cost of \$53.22]</i>		
31-Mar	Sold		20 at \$75	12 units
	Totals	47 units	35 units	

On March 8, 15 units were sold (see above). Which unit costs was the last-in? Twelve units at \$50 each were the last-in (see above and below). On March 31<sup>st</sup> 20 units were sold (see above and below). Which of the remaining unit costs was the last-in? All 12 of the units purchased for \$50 and 3 of the beginning inventory units were sold on March 8<sup>th</sup>. If we assume that costs flow LIFO, 5 of the 8 units from beginning inventory remain in inventory. Therefore, these 5 plus the 18 units purchased on March 18<sup>th</sup> and the 9 units purchased on March 25<sup>th</sup> are available for sale. The costs associated with the 9 units purchased on March 25<sup>th</sup> and 11 of the units purchased on March 18<sup>th</sup> are presumed to have been sold (see above and below).

Journal entries for all of the above transactions are summarized, below.

### PURCHASES FOR MERCHANDISE INVENTORY

These amounts do not change

3-Mar	Merchandise Inventory	\$600
	Accounts Payable	\$600

**Sale of last 15 units →**  
**[12 @ \$50 & 3 @ \$40]**

18-Mar	Merchandise Inventory	\$990
	Accounts Payable	\$990
25-Mar	Merchandise Inventory	\$513
	Accounts Payable	\$513

**Sale of last 20 units →**  
**[9 @ \$57 & 11 @ \$55]**

### SALES & COST OF GOODS SOLD

Cost of Goods Sold and Merchandise Inventory measures change and/or depend on the **cost flow assumption**

8-Mar	Accounts Receivable	\$1,050
	Sales	\$1,050
	Cost of Goods Sold	\$720
	Merchandise Inventory	\$720

31-Mar	Accounts Receivable	\$1,500
	Sales	\$1,500
	Cost of Goods Sold	\$1,118
	Merchandise Inventory	\$1,118

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After these transactions, the Merchandise Inventory account will reflect ending Merchandising Inventory balance of \$585 (LIFO), as shown in T-account form, below:

<u>Merchandise Inventory</u>	
Beginning	\$320
Mar. 3	600
	Mar. 8 \$ 720
Subtotal	\$250
Mar. 18	990
Mar. 25	513
	Mar. 31 \$1,083
Ending	<u>\$585</u>

T-accounts for Sales and Cost of Goods Sold follow:

<u>Cost of Goods Sold</u>		<u>Sales</u>	
Mar. 8	\$ 720		Mar. 8 \$1,050
Mar. 31	1,118		Mar. 31 1,500
Mar.	<u>\$1,837</u>		Mar. <u>\$2,550</u>

The following are the computations and Sales, Cost of Goods Sold, and Gross Profit measures for the March 8<sup>th</sup> and March 31<sup>st</sup> sales, as well as those for both, representing sales for the entire month of March:

	(a)	(b)	Sales for
	Sales on	Sales on	the Month
	<u>8-Mar</u>	<u>31-Mar</u>	<u>of March</u>
Sales	\$1,050.00	\$1,500.00	\$2,550.00
<i>less:</i> Cost of Goods Sold	<u>\$720.00</u>	<u>\$1,118.00</u>	<u>\$1,838.00</u>
<i>equals:</i> Gross Profit	<u>\$330.00</u>	<u>\$382.00</u>	<u>\$712.00</u>
Beginning Inventory	\$320.00	\$200.00	\$320.00
<i>plus:</i> Purchases	<u>\$600.00</u>	<u>\$1,503.00</u>	<u>\$2,103.00</u>
<i>equals:</i> Available for Sale	\$920.00	\$1,703.00	\$2,423.00
<i>less:</i> Ending Inventory	<u>\$200.00</u>	<u>\$585.00</u>	<u>\$585.00</u>
<i>equals:</i> Cost of Goods Sold	<u>\$720.00</u>	<u>\$1,118.00</u>	<u>\$1,838.00</u>



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### Summarizing Journal Entries for the Basic Methods of Cost Flow Assumptions

Recall that there are 4 basic inventory techniques or cost flow assumptions: (1) specific identification, (2) first-in, first-out (FIFO), (3) weighted-average (WAVG), (4) last-in, first-out (LIFO), and

#### 1. Specific Identification journal entries follow:

8-Mar	Cost of Goods Sold	\$?	
	Merchandise Inventory		\$?
31-Mar	Cost of Goods Sold	\$?	
	Merchandise Inventory		\$?

#### 2. First-In, First-Out (FIFO) journal entries follow:

8-Mar	Cost of Goods Sold	\$670	
	Merchandise Inventory		\$670
31-Mar	Cost of Goods Sold	\$1,075	
	Merchandise Inventory		\$1,075

#### 3. Weighted-Average or Moving Weighted-Average (WAVG) journal entries follow:

8-Mar	Cost of Goods Sold	\$690	
	Merchandise Inventory		\$690
31-Mar	Cost of Goods Sold	\$1,083	
	Merchandise Inventory		\$1,083

#### 4. Last-In, First-Out (LIFO) journal entries follow:

8-Mar	Cost of Goods Sold	\$720	
	Merchandise Inventory		\$720
31-Mar	Cost of Goods Sold	\$1,118	
	Merchandise Inventory		\$1,118

## Introductory Financial Accounting – Cataldo (WCU ACC201)

### Summarizing Financial Statement Effects for the Basic Methods of Cost Flow Assumptions

Recall the very simple example used at the beginning of this chapter, as follows:

	<u>Units</u>	<u>Unit Cost</u>	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Beginning Inventory	5	\$1.10	\$5.50	\$5.50	\$5.50
<i>add:</i> Purchases	<u>5</u>	\$1.20	<u>\$6.00</u>	<u>\$6.00</u>	<u>\$6.00</u>
<i>equals:</i> Available	10		\$11.50	\$11.50	\$11.50
<i>less:</i> Ending Inventory	<u>5</u>		<u>\$6.00</u>	<u>\$5.75</u>	<u>\$5.50</u>
<i>equals:</i> Cost of Goods Sold	<u>5</u>		<u>\$5.50</u>	<u>\$5.75</u>	<u>\$6.00</u>

Below are a series of tables, more fully developed, using the same basic framework, but for the example used in the body of the chapter. The original fact pattern is retained:

<u>Date</u>	<u>Description</u>	<u>Units &amp; Cost</u>	<u>Units &amp; Sales</u>	<u>Inventory</u>
1-Mar	Beginning Inventory	8 at \$40 = \$320		8 units
3-Mar	Purchased	12 at \$50 = \$600		20 units
8-Mar	Sold		15 at \$70	5 units
18-Mar	Purchased	18 at \$55 = \$990		23 units
25-Mar	Purchased	9 at \$57 = \$513		32 units
31-Mar	Sold		<u>20 at \$75</u>	<u>12 units</u>
	Totals	<u>47 units</u>	<u>35 units</u>	

	<u>Units</u>	<u>Unit Cost</u>	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Beginning Inventory	8	\$40	\$320	\$320	\$320
<i>add:</i> Purchases	<u>39</u>	varies	<u>\$2,103</u>	<u>\$2,103</u>	<u>\$2,103</u>
<i>equals:</i> Available	47		\$2,423	\$2,423	\$2,423
<i>less:</i> Ending Inventory	<u>12</u>		<u>\$687</u>	<u>\$650</u>	<u>\$585</u>
<i>equals:</i> Cost of Goods Sold	<u>35</u>		<u>\$1,745</u>	<u>\$1,773</u>	<u>\$1,838</u>

Revenues or sales are the same, regardless of the inventory cost flow assumption used, as they were throughout the examples used in the body of the chapter. In the table that follows, operating expenses are assumed at \$300. These, also, would be the same, regardless of the method of inventory valuation. We will ignore income taxes, but focus on the typical pattern for income before tax.

	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Sales	\$2,550	\$2,550	\$2,550
<i>less:</i> Cost of goods sold	<u>\$1,745</u>	<u>\$1,773</u>	<u>\$1,838</u>
<i>equals:</i> Gross profit	\$805	\$777	\$712
<i>less:</i> Expenses	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>
<i>equals:</i> Income before tax	<u>\$505</u>	<u>\$477</u>	<u>\$412</u>

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Generally, income before tax is highest for FIFO, lowest for LIFO, and weighted average (WAVG) is an average of these two extremes.

Balance sheet measures also tend to follow a typical pattern. Again, recall the per unit example used at the beginning of this chapter:

	<u>Units</u>	<u>Unit Cost</u>	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Beginning Inventory	5	\$1.10	\$5.50	\$5.50	\$5.50
<i>add:</i> Purchases	<u>5</u>	\$1.20	<u>\$6.00</u>	<u>\$6.00</u>	<u>\$6.00</u>
<i>equals:</i> Available	10		\$11.50	\$11.50	\$11.50
<i>less:</i> Ending Inventory	<u>5</u>		<u>\$6.00</u>	<u>\$5.75</u>	<u>\$5.50</u>
<i>equals:</i> Cost of Goods Sold	<u>5</u>		<u>\$5.50</u>	<u>\$5.75</u>	<u>\$6.00</u>

Note that per unit cost of goods sold is highest for LIFO, lowest for FIFO, and weighted average (WAVG) is some measure in between the two extremes. Furthermore, this alternative “cost flow assumption” or “cost allocation” method results in the highest per unit inventory under FIFO, the lowest for LIFO, and weighted average (WAVG) is some measure in between the two extremes.

Similarly, the below example used in the body of the chapter produces a comparable pattern for FIFO, WAVG and FIFO for the balance sheet and income statement measures:

	<u>Units</u>	<u>Unit Cost</u>	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Beginning Inventory	8	\$40	\$320	\$320	\$320
<i>add:</i> Purchases	<u>39</u>	varies	<u>\$2,103</u>	<u>\$2,103</u>	<u>\$2,103</u>
<i>equals:</i> Available	47		\$2,423	\$2,423	\$2,423
<i>less:</i> Ending Inventory	<u>12</u>		<u>\$687</u>	<u>\$650</u>	<u>\$585</u>
<i>equals:</i> Cost of Goods Sold	<u>35</u>		<u>\$1,745</u>	<u>\$1,773</u>	<u>\$1,838</u>

- FIFO tends to allocate the fair value measure to the firm’s balance sheet and a lower cost of goods sold to the income statement.
- LIFO tends to allocate a lower than fair value measure to the firm’s balance sheet and a higher cost of goods sold to the income statement, matching the most recent, rising cost to the revenue in the income statement.
- Weighted average (WAVG), effectively, splits the difference between the balance sheet and the income statement.

## Introductory Financial Accounting – Cataldo (WCU ACC201)

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Again, using the example from the body of the chapter:

- FIFO tends to produce the highest gross profit, income before tax and net income.
- LIFO tends to produce the lowest gross profit, income before tax and net income.
- Weighted average (WAVG), again, produces measures in between those produced under the FIFO and LIFO extremes.

	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Sales	\$2,550	\$2,550	\$2,550
<i>less:</i> Cost of goods sold	<u>\$1,745</u>	<u>\$1,773</u>	<u>\$1,838</u>
<i>equals:</i> Gross profit	\$805	\$777	\$712
<i>less:</i> Expenses	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>
<i>equals:</i> Income before tax	<u>\$505</u>	<u>\$477</u>	<u>\$412</u>

### Recall that “Net” Measures are used in the Income Statement

Recall that net measures are used in the income statement:

<u>REVENUES</u>		<u>EXPENSES</u>	
Gross Sales		Gross Purchases	\$XXX
<i>less:</i> Sales Discounts		Purchase Discounts	\$XX
<i>less:</i> Sales Returns		Purchase Returns	\$XX
<i>less:</i> Sales Allowances		Purchase Allowances	<u>\$XX</u> <u>\$XX</u>
<i>equals:</i> Net Sales		Net Purchases	<u>\$XX</u>

Notes: \_\_\_\_\_

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# Introductory Financial Accounting – Cataldo (WCU ACC201)

## Consistency and Comparability

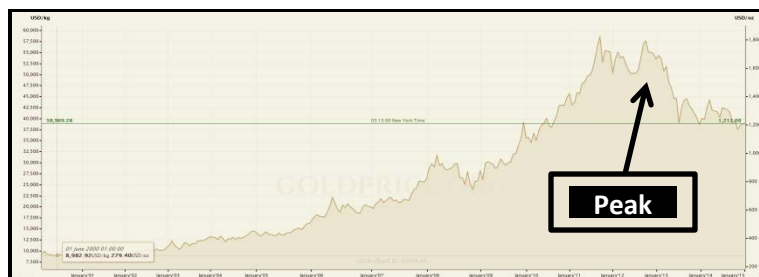
While a firm might choose to use more than 1 inventory valuation methods for different classes of inventory, this is odd, unless they apply an alternative method to some relatively insignificant or immaterial inventory classification. The most important thing to understand is that consistency is necessary. It would not make any sense to use LIFO in the first quarter, FIFO in the second quarter, weighted-average (WAVG) for the third quarter and specific identification for the fourth quarter. Stakeholders (and management) would not be able to evaluate the firm from one quarter to another.

## Lower of Cost or Market

The lower of cost or market (LCM) method is applied when the market value of inventory drops below its historical cost. This could be due to obsolescence and/or the availability of comparable replacement inventory at a lower cost. The loss in value is matched to the period in which the decline in utility or market value occurs. It is an application of the principle of conservatism, where you are to run the risk of undervaluing rather than overvaluing this current asset.

## An Example

Assume that you are a jeweler and hold gold inventory. The price of gold declines:



You would have to record the decline in your gold inventory value in the period in which it occurs so that the loss is matched to the correct income statement period.

## Lower of Cost or Market (LCM) Computation

Lower of cost or market for inventory can be applied (1) to each individual item in inventory, (2) to major classes or categories of inventory, or (3) to the inventory as a whole. It is important to be systematic and rational and methodical in the LCM technique used. It is also important to consistently apply the approach for comparability, particularly in those cases where your firm operates in an industry where valuations fluctuate.

Generally, you debit cost of goods sold and credit the merchandise inventory account for the loss in valuation:

Cost of Goods Sold	\$xxx
Merchandise Inventory	\$xxx

## Introductory Financial Accounting – Cataldo (WCU ACC201)

### A LCM Example

Assume that a firm has 3 classifications of inventory: widgets, didgets and fidgets:

Item	Units	Per unit Cost	Per unit Market	Total Cost	Total Market	Lower of Cost or Market
Widgets	20	\$5	\$4	\$100	\$80	\$80
Didgets	10	\$10	\$10	\$100	\$100	\$100
Fidgets	5	\$20	\$20	<u>\$100</u>	<u>\$100</u>	<u>\$100</u>
<b>TOTALS</b>				<u>\$300</u>	<u>\$280</u>	<u>\$280</u>

The market has declined for widgets, as a new invention, the gadget is being produced at a much lower cost. Consequently, the widgets in the firm's inventory cannot be sold for more than \$4 per unit (i.e., decline from \$100 to \$80 for widget inventory). In this case, the loss to be matched to the period in which the market value decline occurred results in the following journal entry:

Cost of Goods Sold	\$20
Merchandise Inventory	\$20

Some firms may prefer to isolate this measure in a separate account, later to be closed to cost of goods sold, as follows:

Cost of Goods Sold - LCM	\$20
Merchandise Inventory	\$20

### How Are Financial Statements Affected by Inventory Errors

A two-period model will be used to illustrate how errors in inventory counts for period 1 affect period 1 and period 2 balance sheet and income statement measures. Excel, with formulas, was used to generate alternative based on all possible directional errors, at \$10 each, for beginning and ending inventory during period 1. All are labelled inside of the box. Begin with the "correct" measures:

Correct	Year 1	Year 2
Beginning Inventory	\$100	\$150
<i>add:</i> Purchases of Inventory	<u>\$200</u>	<u>\$210</u>
<i>equals:</i> Inventory Available for Sale during the Period	\$300	\$360
<i>less:</i> Ending Inventory	<u>\$150</u>	<u>\$190</u>
<i>equals:</i> Cost of Goods Sold	<u>\$150</u>	<u>\$170</u>

Recall that ending inventory for year 1 is the same as beginning inventory for year 2 at \$150. In the below case, assume that an error occurred and beginning inventory for year 1 was understated by \$10:

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Assume Year 1 Beginning Inventory understated		<u>Year 1</u>	<u>Year 2</u>
	Beginning Inventory	\$90	\$150
<i>add:</i>	Purchases of Inventory	<u>\$200</u>	<u>\$210</u>
<i>equals:</i>	Inventory Available for Sale during the Period	\$290	\$360
<i>less:</i>	Ending Inventory	<u>\$150</u>	<u>\$190</u>
<i>equals:</i>	Cost of Goods Sold	<u>\$140</u>	<u>\$170</u>

Focus on and compare measures for both (1) ending inventory and (2) cost of goods sold for both years 1 and 2.

Still focused on differences from the “correct” measures, assume, now, that an error occurred and beginning inventory for year 1 was overstated by \$10:

Assume Year 1 Beginning Inventory overstated		<u>Year 1</u>	<u>Year 2</u>
	Beginning Inventory	\$110	\$150
<i>add:</i>	Purchases of Inventory	<u>\$200</u>	<u>\$210</u>
<i>equals:</i>	Inventory Available for Sale during the Period	\$310	\$360
<i>less:</i>	Ending Inventory	<u>\$150</u>	<u>\$190</u>
<i>equals:</i>	Cost of Goods Sold	<u>\$160</u>	<u>\$170</u>

Again, focus on and compare measures for both (1) ending inventory and (2) cost of goods sold for both years 1 and 2.

For the above two examples we focused on beginning inventory measures and errors. For the two examples that follow, we will focus on ending inventory measures and errors.

First, assume that the physical count of ending inventory for year 1 was incorrectly understated. Again, track differences between incorrect and correct balance sheet and income statement measures.

Assume Year 1 Ending Inventory understated		<u>Year 1</u>	<u>Year 2</u>
	Beginning Inventory	\$100	\$140
<i>add:</i>	Purchases of Inventory	<u>\$200</u>	<u>\$210</u>
<i>equals:</i>	Inventory Available for Sale during the Period	\$300	\$350
<i>less:</i>	Ending Inventory	<u>\$140</u>	<u>\$190</u>
<i>equals:</i>	Cost of Goods Sold	<u>\$160</u>	<u>\$160</u>

Finally, assume that the physical count of ending inventory for year 1 was incorrectly overstated. As you have done in all of the above cases, track differences between incorrect and correct balance sheet (ending inventory) and income statement (cost of goods sold) measures.

## Introductory Financial Accounting – Cataldo (WCU ACC201)

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Assume Year 1 Ending Inventory overstated		<u>Year 1</u>	<u>Year 2</u>
	Beginning Inventory	\$100	\$160
<i>add:</i>	Purchases of Inventory	<u>\$200</u>	<u>\$210</u>
<i>equals:</i>	Inventory Available for Sale during the Period	\$300	\$370
<i>less:</i>	Ending Inventory	<u>\$160</u>	<u>\$190</u>
<i>equals:</i>	Cost of Goods Sold	<u>\$140</u>	<u>\$180</u>

If you overstate cost of goods sold, you understate gross margin, net income before tax and net income and earnings per share. If you understate cost of goods sold, you overstate gross margin, net income before tax and net income and earnings per share.

Appendix A

# Inventory Turnover

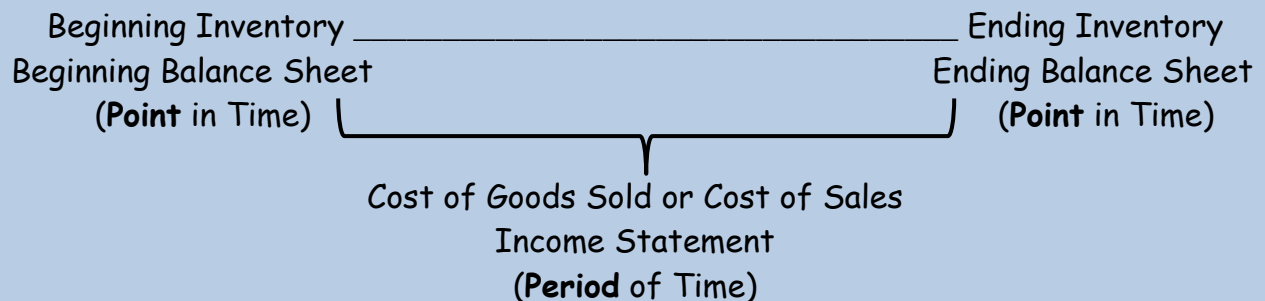
Inventory must be sold for cash or sold on account or on credit. One indicator of superior management is the speed with which the inventory “turns.”

Keep in mind, if inventory is stored, the facility and receiving and maintenance of this assets costs money. If you can turn your inventory over very quickly, you require less storage, incur lower costs, and can proceed to collect cash on the sale faster.

There are industry averages for all financial ratios, including inventory turnover, by industry. These comparisons allow us to evaluate management’s performance with respect to inventory and inventory management. The basic formula for the computation of inventory turnover follows:

$$\text{Inventory turnover} = \text{Cost of goods sold} \div \text{Average inventory}$$

As is the case with all turnover measures, the numerator comes from the income statement, covering a period of time, and the denominator comes from both beginning and ending balance sheets or point in time measures, or the average of the beginning of the period and the end of the period.



Appendix B

# Days' Sales in Inventory

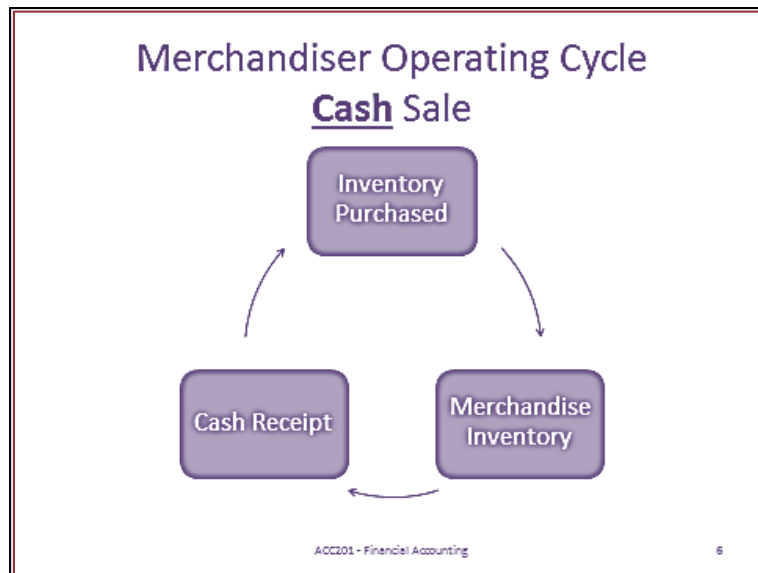
Days' sales in inventory, like inventory turnover, provide measures by which management performance can be compared within an industry. Too much suggests higher storage costs. Too little suggests the risk of a "stock-out." It can be computed based on a 30-day month or using 365 days per year, as follows:

$$\text{Days' sales in inventory} = \frac{[\text{Ending inventory} \div \text{Cost of goods sold}] \times 365}{\text{or}}$$

$$\text{Days' sales in inventory} = \frac{[\text{Ending inventory} \div \text{Cost of goods sold}] \times 360}{\text{or}}$$

Unlike inventory turnover, days' sales in inventory focus only on ending inventory. We want to know how many days it will take to convert ending inventory to cash.

Recall that inventory must be sold, for cash or on account (credit). If sold on account, the accounts receivable must be collected.





Increases in ending inventory increases the number of Days' Sales in Inventory and is viewed less than favorably.



Appendix C

# A Periodic System of Inventory Costing

## A Single Fact Pattern – A Periodic Inventory System

The below will be used to illustrate the impact of an inventory cost flow assumption on a firm's selected balance sheet and income statement measures for the month of March. Assume that the firm uses the periodic inventory system. Therefore, merchandise inventory is periodically updated to reflect merchandise inventory purchases and retail sales.

Date	Description	Units & Cost	Units & Sales	Inventory
1-Mar	Beginning Inventory	8 at \$40 = \$320		8 units
3-Mar	Purchased	12 at \$50 = \$600		20 units
8-Mar	Sold		15 at \$70	5 units
18-Mar	Purchased	18 at \$55 = \$990		23 units
25-Mar	Purchased	9 at \$57 = \$513		32 units
31-Mar	Sold		20 at \$75	12 units
	Totals	47 units	35 units	

Focusing, first, on the journal entries that do not change, regardless of whether you use (1) specific identification, (2) first in, first out (FIFO), (3) weighted average (WAVG), or (4) last in, first out (LIFO) inventory methods. For purchases:

3-Mar	Purchases (12 units)	\$600	
	Accounts payable		\$600
18-Mar	Purchases (18 units)	\$990	
	Accounts payable		\$990
25-Mar	Purchases (9 units)	\$513	
	Accounts payable		\$513

For sales:

8-Mar	Accounts receivable	\$1,050	
	Sales (15 units)		\$1,050
31-Mar	Accounts receivable	\$1,500	
	Sales (20 units)		\$1,500

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For cost of goods sold, recall that n=35 units (15 plus 20 on 8-Mar and 31-Mar, respectively) were sold during the period, and there were n=8 units in beginning inventory, so N=47 units were available for sale during the period, as follows:

<u>Date</u>	<u>Description</u>	<u>Units &amp; Cost</u>
1-Mar	Beginning Inventory	8 at \$40 = \$320
3-Mar	Purchased	12 at \$50 = \$600
18-Mar	Purchased	18 at \$55 = \$990
25-Mar	Purchased	9 at \$57 = \$513
	Totals	<u>47 units</u>

Of the N=35 units sold during the period, management has determined that n=4 units were from beginning inventory, n=10 units were from the 3-Mar purchase, n=15 units were from the 18-Mar purchase and n=6 units were from the 25-Mar purchase, as follows:

<u>Date</u>	<u>Units Sold</u>	<u>Cost per Unit</u>	<u>Total Cost</u>
1-Mar	4	\$40	\$160
3-Mar	10	\$50	\$500
18-Mar	15	\$55	\$825
25-Mar	<u>6</u>	\$57	<u>\$342</u>
	<u>35</u>		<u>1827</u>

The **Specific Identification**, **First-In, First-Out (FIFO)**, **Weighted-Average or Moving Weighted-Average (WAVG)**, and **Last-In, First-Out (LIFO)** computations of ending inventory, cost of goods sold, and gross margins follows:

	<u>Units</u>	<u>Specific Identification</u>	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Available	47	\$2,423	\$2,423	\$2,423	\$2,423
<i>less:</i> Ending Inventory	<u>12</u>	<u>\$596</u>	<u>\$678</u>	<u>\$619</u>	<u>\$520</u>
<i>equals:</i> Cost of Goods Sold	<u>35</u>	<u>\$1,827</u>	<u>\$1,745</u>	<u>\$1,804</u>	<u>\$1,903</u>

	<u>Units</u>	<u>Specific Identification</u>	<u>FIFO</u>	<u>WAVG</u>	<u>LIFO</u>
Sales	35	\$2,650	\$2,650	\$2,650	\$2,650
<i>less:</i> Cost of goods sold	<u>35</u>	<u>\$1,827</u>	<u>\$1,745</u>	<u>\$1,804</u>	<u>\$1,903</u>
<i>equals:</i> Gross profit	<u>-0-</u>	<u>\$823</u>	<u>\$905</u>	<u>\$846</u>	<u>\$747</u>

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The **Specific Identification** journal entry follows:

31-Mar	Merchandise inventory (ending)	\$596	
	Income summary		\$276
	Merchandise inventory (beginning)		\$320

The **First-In, First-Out (FIFO)** journal entry follows:

31-Mar	Merchandise inventory (ending)	\$678	
	Income summary		\$358
	Merchandise inventory (beginning)		\$320

The **Weighted-Average or Moving Weighted-Average (WAVG)** journal entry follows:

31-Mar	Merchandise inventory (ending)	\$619	
	Income summary		\$299
	Merchandise inventory (beginning)		\$320

The **Last-In, First-Out (LIFO)** journal entry follows:

31-Mar	Merchandise inventory (ending)	\$520	
	Income summary		\$200
	Merchandise inventory (beginning)		\$320

Note that the income summary measure is a “plug.”

Appendix D

# Inventory Estimation Methods

These inventory valuation methods are more likely to be addressed in an intermediate financial accounting course, but are introduced below:

## Retail Inventory Methods



Retail inventory methods are used to reduce the cost associated with making frequent, manual counts of physical inventory, estimating the allocation of goods available for sale between the balance sheet ending inventory measure and the income statement cost of goods sold measure. They use the “selling price” of the inventory, as follows:

	<b>Inventory Available for Sale during the Period at Retail</b>	<b>\$XX</b>
<i>less:</i>	<b>Ending Inventory at Retail</b>	<b><u>\$XX</u></b>
<i>equals:</i>	<b>Cost of Goods Sold in terms of Net Sales at Retail</b>	<b><u>\$XX</u></b>

Alternatively:

	<b>Inventory Available for Sale during the Period at Retail</b>	<b>\$XX</b>
<i>less:</i>	<b>Cost of Goods Sold in terms of Net Sales at Retail</b>	<b><u>\$XX</u></b>
<i>equals:</i>	<b>Ending Inventory at Retail</b>	<b><u>\$XX</u></b>

The firm must compute a cost-to-retail ratio, perhaps, separately, for several classifications of inventory, as follows:

$$\text{Cost-to-Retail Ratio} = \text{Cost} \div \text{Retail}$$

By multiplying the cost-to-retail ratio by the ending inventory, at retail, the firm computes an estimated ending inventory cost measure, as follows:

$$\text{Ending Inventory at Cost} = \text{Ending Inventory at Retail} \times \text{Cost-to-Retail Ratio}$$

## Gross Profit Method

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The gross profit method is often necessary when inventory is lost, destroyed, or stolen, perhaps for insurance recovery purposes, as follows:

$$\text{Estimated Cost of Goods Sold} = \text{Net Sales at Retail} \times [1.0 - \text{Gross Profit Ratio}]$$

$$\text{Estimated Ending Inventory at Cost} = \text{Goods Available for Sale at Cost} - \text{Estimated Cost of Goods Sold}$$