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Module 8

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Click the link below to play an audio presentation that will introduce you to the topics covered in this module.

[Link to “Module 8 Introduction”](#)

Module 8 Summary

I. Accounting for Inventory

A. What is *Merchandise Inventory*?

1. A merchant's inventory is composed of goods that are *owned* and *held for the sole purpose of resale* in the regular course of business operations. Therefore, supplies or equipment that the business no longer needs and that it is trying to sell do not qualify as "inventory" assets. Neither do inventory items such as furniture or equipment that are used in the business while available for sale. These things do not meet the definition of "inventory" and should not be reported as *Merchandise Inventory* on the balance sheet.
2. As we learned in Module 5, the costs that can be included in the *Merchandise Inventory* account are the costs that *had to be incurred in order to acquire the inventory and to ready it for sale*.
3. Inventory items may be purchased or manufactured, but we will assume that inventory is purchased in this tutorial. The Managerial Accounting tutorial deals with manufacturing and accounting for manufactured inventories.
4. When the inventory is composed of hundreds of different items that were purchased at different times and for different prices, determining the balance of the *Merchandise Inventory* account can be a very complicated process. It is made even more complicated by the many rules that are found in GAAP regarding inventories. (Remember what accounting masochists say when complications arise? :)

B. Why all the complications? Why are there so many accounting rules concerning the *Merchandise Inventory* account and its balance?

1. Simply because the *Merchandise Inventory* and the *Cost of Goods Sold* accounts are linked together. What we do with inventory affects not only the balance sheet and its assets, but also the income statement and the reported amount of net income or loss. When inventory balances are large, the value we place upon them has a big impact on the amount we report as net income or loss. Let's explain how this happens.

2. The **cost of the goods available for sale** during an accounting period is equal to the cost of the beginning inventory plus the cost of the inventory items that were purchased during the period. Logically, since the merchandise that was available for sale during the period was either sold or was left in the ending inventory, the *cost of the goods sold is equal to the cost of goods available for sale minus the ending inventory*:

Beginning Inventory Balance	\$X
+ Purchases	+X
= Cost of Goods Available for Sale	\$X
- Ending Inventory	(X)
= Cost of Goods Sold	\$X

2. Therefore, the cost of goods sold and the ending inventory value are directly related. Placing a dollar value on one automatically determines the value of the other. To restate and summarize:
- The portion of the total cost of the goods available for sale that is assigned to the ending inventory flows onto the balance sheet. It does not appear on the income statement in the *Cost of Goods Sold* and it does not affect net income. Instead, it is carried over to the next accounting period as an asset (where it will be the *Inventory* account balance at the beginning of the following period).
 - The portion of the cost of goods available for sale that is *not* assigned to the ending inventory will appear on the income statement. It will be part of the *Cost of Goods Sold* account and it will affect the amount of net income or loss reported for the current period.

Does this help?

Suppose you a sports memorabilia collector, and you have two autographed baseballs. One you bought from a sporting goods store for \$5, and you then had it autographed at the stadium following a game. Afterwards, you bought another from a friend's collection for \$100. Both balls were identical, and even you couldn't even which was which.

You now have two baseballs in your "inventory," and the cost of the goods you have available for sale is \$105. Suppose you sell one of the balls to another friend for \$50. Which ball do you still have, the \$100 ball or the \$5 ball?

The answer to the question has a big impact on your profitability and what your friends will think of you and your hobby. If you still have the \$5 ball, then

the cost of the ball you sold was \$100 and you have a \$50 loss. If you still have the \$100 ball, then you sold the \$5 ball and you have a profit of \$45. Or perhaps we should average your costs, and say that each ball has an average cost of \$52.50 ($\$105 / 2$ balls). That would give you a loss of \$2.50.

Clearly, the way we calculate the cost of the ball you still have (your ending inventory) is very important. It will determine the cost of ball you sold and the amount of your profit or loss.

Under GAAP, we have four acceptable ways in which we can “cost” your ending inventory and thereby determine the cost of the ball you sold. They happen to be exactly the same methods that we were just discussing:

1. Specific Identification

If possible, specifically identify which ball is still left, and use its cost to determine the ending inventory balance. This isn't possible, though, in your case.

2. FIFO (first-in, first-out)

The first item you acquired (the \$5 ball) is assumed to be the first to be sold. Therefore, under FIFO, the \$100 ball is still left in your ending inventory, the cost of goods sold is \$5, and you have a \$45 profit.

3. LIFO (last-in, first-out)

The last item you acquired (the \$100 ball) is assumed to be the first to be sold. Therefore, under LIFO, the \$5 ball is still left in your ending inventory, the cost of goods sold is \$100 and you have a \$50 loss.

4. Average Cost

The average cost of the goods available for sale [$(\$100 + 5)/2 = \52.50 per ball], is used to determine the cost of your ending inventory. Therefore, your ending inventory balance is \$52.50, your cost of goods sold is \$52.50, and you have a loss of \$2.50.

These four methods are discussed in depth in the section below.

II. Inventory Valuation

- A. **Inventory valuation** is a major issue for merchandising businesses. The goal in valuing inventory is not just to produce an appropriate inventory valuation figure to report on the balance sheet, but also to best match expenses (the *Cost of Goods Sold*) with revenues (*Sales*).

- B. It would be very easy to value the inventory if all of the inventory units had the same cost. We could just count the number of units in the inventory, multiply by the cost (that one single price we paid for each unit), and have our answer. We would have no complicated calculations to make, and no worries about matching revenues with expenses.

A Note on Prices and Inflation

Economists refer to increasing price levels as *inflation*, and to decreasing price levels as *deflation*. Inflation has been the norm for a century, with prices for things tending to rise over time. There are exceptions, of course. For example, a desktop PC that cost \$5,000 in the 1980's can now be purchased for \$500. That is not what has happened with houses, cars, food and materials costs, though. In general, prices for things in general have risen over time, and we should assume that this trend will continue. In our discussion below, we will assume that the prices paid by the company for its inventory items have risen during the accounting period. That's probably a pretty safe assumption, though there are exceptions.

- C. Unfortunately, the prices paid for inventory items during the period are never constant. And when different prices are paid at different times during the period, we will have to answer two important questions. Which units were sold, and which are left in the inventory?
- D. Note that these are the same questions we encountered with your two baseballs in the example above. And as we learned in that example, there are four inventory valuation methods that are acceptable under GAAP:
1. ***Specific Identification:*** The goods left in the inventory are identified by serial number, bar code, etc., and then their individual costs are gathered from the purchase invoices. We add them all up and we have the inventory at its actual, historical cost.

This may not be possible with some inventories, but even when it can be done many companies will still choose to use one of the other methods. Why? Because the other methods are also acceptable, they are easier to apply, and the companies may feel that the other method results in a better "match" of revenues and expenses (remember the Matching Principle from Module 4?).
 2. ***FIFO:*** The goods "first in" (those that were purchased first) are assumed to be the goods "first out" (the first sold). This is a logical inventory flow assumption and it is a common-sense way to view the inventory.

- a. In a period of rising inventory prices FIFO assumes that the earlier, lower costs flow into *Cost of Goods Sold*, and that the higher, later costs are left in *Inventory*. Therefore,
 - *FIFO produces a lower cost of goods sold amount than any of the other valuation methods. This results in higher gross profit and net income figures.*
 - *FIFO also produces a higher inventory valuation than any of the other methods. This results in a larger inventory account balance, and more assets to report on the balance sheet.*
 - b. The *highest* amounts for gross profit, net income, and inventory? Let's think of FIFO as the "First in **I**ncome, **F**irst in **O**vervalued inventory" method.
 - c. Note that these bullet points all reverse if prices fall rather than rise. If the prices paid for the inventory items fall over time, FIFO will assume that the earlier, *higher* costs flow into *Cost of Goods Sold*, and that the later, *lower* costs are left in *Inventory*. In a period of *falling* prices, FIFO will produce the *lowest* gross profit, net income and inventory valuation figures!
3. **LIFO:** The goods "last in" are assumed to be the goods "first out." LIFO is the reverse of the FIFO inventory flow assumption, and it makes no sense at all. How can items be sold when they aren't even in the inventory? How can we assume that an item purchased in the last week of January was sold in the first week of January? Well, uh..., we just do. And it is acceptable under GAAP. So don't worry about it. I'm busy now - go ask your mother! 8^)
- a. In a period of rising inventory prices LIFO assumes that the later, higher costs flow into *Cost of Goods Sold*, and that the earlier, lower costs are left in *Inventory*. Therefore,
 - *LIFO produces a higher cost of goods sold amount than any of the other valuation methods. This results in lower gross profit and net income figures.*
 - *LIFO also produces a lower inventory valuation than any of the other methods. This results in a smaller*

inventory account balance, and fewer assets reported on the balance sheet.

- b. The *lowest* amounts for gross profit, net income, and inventory? Think of LIFO as the "Last in Income, last in **O**vervalued inventory" method. (I know, but I can't think of a good word to go with the "F.")
 - c. Note that these bullet points all reverse if prices fall rather than rise. If the prices paid for the inventory items fall over time, LIFO will assume that the later, *lower* costs flow into Cost of Goods Sold, and that the earlier, *higher* costs are left in Inventory. In a period of *falling* prices, LIFO will produce the *highest* gross profit, net income and inventory valuation figures!
4. **Average Cost:** This method assumes equally proportionate sales from all the cost "layers" in inventory. The average cost per unit is determined by dividing the *cost of merchandise available for sale* by the number of units available for sale.

$$\text{Average Cost per Unit} = \frac{\text{Cost of Merchandise Available for Sale}}{\text{Number of Units Available for Sale}}$$

This average cost is multiplied by the number of units in inventory and by the number of units sold to determine the *Inventory* balance and the *Cost of Goods Sold*.

- *If costs have steadily risen (or fallen), the average cost method produces inventory valuations, gross profit, and net income figures that will all fall between the extremes produced by LIFO and FIFO.*
- *If prices are all "jumbled up," sometimes rising and sometimes falling during the period, then it is possible that the average cost method will result in inventory and income amounts that are either greater than or less than those produced by FIFO or LIFO.*



Click the link below to play the free YouTube video presentation that illustrates the use of the FIFO, LIFO and Average Cost methods.

[Link to "Inventory Valuation - 1" YouTube Presentation \(12 minutes\)](#)

Consistency: We have seen that accountants have a “grab bag” of choices available to them regarding the way the inventory and the cost of goods sold can be valued under GAAP. Why are there so many choices? Why isn’t there just one single method that is allowable under GAAP?

Not every company is the same, and a single method will not “fit” every company equally well. The accountant should be free to select a method that does the best job of accurately reflecting the company’s true financial position and profitability. The use of alternative methods (such as LIFO, FIFO and Average Cost) allows the accountant to do this, but it also opens the door to manipulation of the financial statements. That is one reason why ethics are so important in business and accounting.

One of the accounting principles, the **Consistency Principle**, helps to curtail the problem of manipulation. It tells us that once a method is chosen, we should only change to a different method if business conditions change. When the old method no longer does a good job of reflecting the business’ actual operational results, it is acceptable to switch to a different method. However, this should occur very infrequently, and the company should otherwise remain consistent in the use of the chosen method. Therefore, a company is not able to switch methods every time the financial statements are prepared, just to manipulate the reported income figures and the asset account balances.

Companies also have choices regarding the methods they use to account for other assets and expenses, so we will encounter this “flexibility” in GAAP again and again.

D. Perpetual Inventory Systems and Valuation Issues

1. When a perpetual inventory system is used, the *Cost of Goods Sold* must be recorded every time a sale is made. Therefore, we must determine which items were sold and at what cost *each time a sale is recorded*. And *we must do this at the time the items are sold, before all the purchases in the period have been recorded*. Note that under a periodic inventory system, this question is answered at the end of the period, *after all the purchases have been recorded*.
2. Because of these "timing" differences, the use of *LIFO* and *Average Cost* methods in a perpetual system will normally produce different inventory valuations and different *Cost of Goods Sold* figures than they would in a periodic inventory system. Only FIFO and Specific Identification will produce the same valuations in both inventory systems.

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Click the link below to play a short video presentation that illustrates the use of the FIFO and LIFO methods with perpetual inventory systems.

[Link to “Inventory Valuation - 2” Presentation](#)

III. Effects of Inventory Valuation on the Financial Statements

- A. The value that is assigned to the ending inventory does not affect just the current period’s balance sheet. The income statements in both the current accounting period and the following period are also affected.
- B. As we saw above, inventory valuations vary depending on the accounting method selected. They are also subject to error and even outright manipulation. Therefore, business professionals should have a sound understanding of the way that the financial statements are affected by the way the ending inventory is valued. They will then be better able to assess a company’s profitability and liquidity position, especially when large inventories are involved.
- Remember that the cost of goods sold is equal to the cost of goods available for sale minus the ending inventory:

<i>Beginning Inventory Balance</i>	\$X	
<i>+ Purchases</i>	<u>+X</u>	
<i>= Cost of Goods Available for Sale</i>		\$X
<i>- Ending Inventory</i>		<u>(X)</u>
<i>= Cost of Goods Sold</i>		\$X

This means that any cost that is assigned to ending inventory will not appear in the current period’s Cost of Goods Sold (COGS). It will, though, flow into COGS in the following period, when the goods are sold.

- Therefore, *undervaluation of the ending inventory understates the current period's net income, but results in an overstatement of the following period's net income. Overvaluation produces the opposite effect -- the current period's income is overstated and the following period's income is understated.* This is illustrated below:

Effects of Overstatement of Ending Inventory in Year 1			
YEAR 1		YEAR 2	
Beginning Inventory Balance		Beginning Inventory Balance	↑
+ Purchases		+ Purchases	
= Cost of Goods Available for Sale		= Cost of Goods Available for Sale	↑
- Ending Inventory	↑	- Ending Inventory	
= Cost of Goods Sold	↓	= Cost of Goods Sold	↑
Effect on Gross Profit & Net Income		↑	Effect on Gross Profit & Net Income
		↓	
Overstatement of ending inventory in year 1 results in an understatement of COGS and an overstatement of Net Income in year 1 (see arrows). Year 2's beginning inventory is year 1's ending inventory, so Cost of Goods Available for Sale and COGS will be overstated in year 2, and Net Income will be understated.			

Effects of Understatement of Ending Inventory in Year 1			
YEAR 1		YEAR 2	
Beginning Inventory Balance		Beginning Inventory Balance	↓
+ Purchases		+ Purchases	
= Cost of Goods Available for Sale		= Cost of Goods Available for Sale	↓
- Ending Inventory	↓	- Ending Inventory	
= Cost of Goods Sold	↑	= Cost of Goods Sold	↓
Effect on Gross Profit & Net Income		↓	Effect on Gross Profit & Net Income
		↑	
Understatement of ending inventory in year 1 results in an overstatement of COGS and an understatement of Net Income in year 1 (see arrows). Year 2's beginning inventory is year 1's ending inventory, so Cost of Goods Available for Sale and COGS will be understated in year 2, and Net Income will be overstated.			

- C. Overvaluation or undervaluation of the inventory can result from mistakes made in recording purchases and sales. This can also occur when physical inventories are taken and inventory items are miscounted. It is especially easy to make errors when goods are ***in transit*** or when goods are being held on ***consignment***.
1. Items purchased but still in transit to the company should be counted in the buyer's inventory (and the purchase should be recorded by the buyer) only if legal title has passed to the buyer. If the terms are FOB shipping point, title will have passed; if the terms are FOB destination, title will not have passed. (See module 6 for a review of shipping terms.)


2. Items sold and still in transit to the customer should be omitted from the seller's inventory count (and the sale should be recorded by the seller) only if title has passed to the customer. If the terms of sale are FOB shipping point, title will have passed; but if the terms are FOB destination, title will not have passed.
3. Items belonging to others but held for sale on *consignment* must not be counted in the inventory; goods sent out to others for sale on consignment must be included in the inventory.

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IV. The Lower of Cost of Market (LCM) Valuation Method

- A. Under GAAP, *inventory must be carried on the balance sheet at either its original cost or its current **market value**, whichever is lower*. This is referred to as “the lower of cost or market,” or “LCM.”
1. **Market value** is defined as the replacement cost of the inventory, or in other words, what it would cost to buy an identical item from the supplier today.
 2. Under GAAP, lower-of-cost-or-market may be applied to each *individual item* in inventory, or to each *major category* of inventory, or to *the inventory as a whole* (though this last method is not allowed in the United States for income tax reporting).
 3. Individual item valuation results in the lowest possible market valuation and is the most conservative method to use. Consider the following example:

Inventory Item	Number of Units	Historical Cost per Unit	Total Historical Cost	Market Value per Unit	Total Market Value	Lower of Cost or Market by Individual Item
A	100	\$5	\$ 500	\$8	\$ 800	\$ 500
B	200	\$6	\$ 1,200	\$7	\$ 1,400	\$ 1,200
C	100	\$7	\$ 700	\$6	\$ 600	\$ 600
D	200	\$8	\$ 1,600	\$5	\$ 1,000	\$ 1,000
			<u>\$ 4,000</u>		<u>\$ 3,800</u>	<u>\$ 3,300</u>



Either amount may be used to determine the inventory's value according to LCM.

In this example, the inventory's total market value (\$3,800) is one amount that may be used to determine the inventory value to report on the balance sheet. However, the sum of each individual inventory item's LCM value (\$3,300) may also be used. Why are the two amounts different? When total market value is used, the \$300 market value increase for Item A, and the \$200 market value increase for Item B, partially offset the \$100 decrease for Item C and the \$600 decrease for item D. Only the net decrease in market value of \$200 "counts" in determining the market value. When LCM is determined for each item, the "increases" are not allowed to offset any of the "decreases," guaranteeing a lower overall market value for the inventory.

3. When it is necessary to "**write down**" the inventory from original cost to its current market value, a **loss** account is debited for the difference between cost and market value. This might be called "Loss from Inventory Revaluation," "Loss from Reduction of Inventory from Cost to Market Value," or any number of other titles.
 - a. Losses are simply another type of expense that the business might incur and that would be recorded and reported on the income statement. Losses are closed into *Income Summary*, along with the other expenses of the period.
 - b. When inventory is written down and the loss account is debited, an inventory *contra-account* is often credited. If a contra-account is not used, then the *Inventory* account will be credited directly:

Loss from Revaluation of Inventory	\$X	
Inventory		\$X

or

Loss from Revaluation of Inventory	\$X	
Allowance for Inventory Revaluation		\$X

- c. If it is used, the contra-account functions just like the "Accumulated Depreciation" account that was introduced in Module 3, and it serves the same purpose. The balance in the contra-account is subtracted from the balance in the Inventory account, and the difference is reported as the carrying value of the inventory on the balance sheet:

<u>Current Assets</u>	
<u>Inventory</u>	
Less: Allowance for Inventory Revaluation	\$X
	(X) \$X

This is original cost

This is the carrying value (equal to market value)

- d. When a contra-account is used, the company is able to disclose its inventory at original, historical cost; and also disclose the amount by which the market value of the inventory has declined. This kind of presentation is in keeping with the accounting *Principle of Full Disclosure*.

The Principle of Full Disclosure is another accounting principle that underlies GAAP. The idea is that all the information about the company that investors and creditors need in order to make good investment and lending decisions should be provided to them. Any information that is not useful to them does not have to be disclosed, since it will not be useful to them. Using a contra-account discloses, on the balance sheet, the amount by which the inventory has been affected by declines in replacement cost. If a contra-account is not used, the decline will not be disclosed.

As we indicated above, some companies do not use contra-accounts and you might wonder why they are not disclosing this information. It is possibly because the amounts are so small that they do not matter (they are immaterial). Or, it is possible that the company is disclosing the information after all, but in the footnotes to the balance sheet and not on its face. When you are reading a company's annual report, don't skip over the footnotes. A lot of information that is not disclosed in the statements, themselves, will be found in the footnotes.

- B. **Distressed inventory items** (damaged or obsolete goods) do not have an identifiable market value (replacement cost). In this case, the distressed inventory should be carried at its *net realizable value*. This is the amount, net of any costs of disposal, that we estimate the company will receive for the items when they are finally sold.
- C. Note that you have now encountered three different methods that are used to value assets on the balance sheet:
- *historical cost* (used for buildings, equipment, etc.)
 - *net realizable value* (used for distressed inventory)
 - *the lower of cost or market* (used with inventory).

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V. Estimating Inventory Balances.

- A. In order to provide for good internal control over the inventory, it is necessary to take a physical count of the items in the inventory and

determine the inventory's value from time to time. No business owner looks forward to "taking the inventory." It is complicated, costly, and it disrupts operations. Unfortunately, it is also necessary.

1. Under periodic inventory systems, entries are not made to record the changes in *Inventory* that result from sales, so exact ending inventory balances can only be determined by taking the inventory.
 2. Even in perpetual inventory systems, inventory **shrinkage** (loss of inventory through breakage or shoplifting) can cause differences between the recorded balance in the Inventory account and the true value of the inventory on the sales floor. In order to measure the losses from shrinkage, it is necessary to take the inventory.
- B. Sometimes, though, we may be able to avoid an actual, physical count of the inventory, and *estimate* the inventory instead. There are two methods that can be used to estimate inventory balances, the **gross profit method** and the **retail method**. They can be used in periodic systems to prepare estimated income statements, or in perpetual systems to verify the balances of *Inventory* and *Cost of Goods Sold*.
- C. **Gross Profit Method.** Under the gross profit method, *gross profit* is first estimated by multiplying *Sales*, or sometimes *Net Sales*, by the **gross profit ratio**. This gross profit ratio can be calculated in two ways:

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}}$$

or

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Net Sales}}$$

1. The gross profit ratios from a large sample of past income statements might be averaged to determine an average ratio, or a value may merely be estimated for the current year.
 - a. In either case, once an appropriate ratio value is derived, it is then multiplied by either *Sales* or by *Net Sales* to estimate the current period's gross profit.
 - b. When the gross profit figure has been estimated, it can then be subtracted from either *Sales* or *Net Sales* to estimate the period's *Cost of Goods Sold*.

- c. *Ending Inventory* can next be estimated by subtracting this estimated *Cost of Goods Sold* from the known *cost of the goods available for sale* (*beginning inventory plus inventory purchases*).
2. This method is only as good as the gross profit ratio estimate upon which it is based!
 3. Since the gross profit ratio is usually an average of several ratios calculated in several prior periods, the ratio may not reflect conditions in the present period very well and may lead to substantial error in the estimated ending inventory balance.

Here's an example. Suppose James Company knows that its beginning inventory was \$200,000, and that it made purchases of \$600,000 during the accounting period. Its gross profit is normally 30% of sales. If the sales made during the period were \$1,000,000, then the gross profit can be estimated to be \$300,000 (\$1,000,000 x 30%). If the James Company accountant prepares an income statement, inserting all the figures that are now known, it would appear as follows:

Sales		\$1,000,000	
Cost of Goods Sold:			
Beginning Inventory	\$200,000		
Purchases	<u>600,000</u>		Estimate #3
Cost of Goods Available for Sale	\$800,000		
Subtract Ending Inventory	(?)		Estimate #2
Cost of Goods Sold		(?)	
Gross Profit (= 30% of Sales)		\$300,000	Estimate #1

We may now “work backwards” on this incomes statement, and determine the value of the ending inventory. The cost of goods sold must be \$700,000 (\$1,000,000 - \$300,000), and so the ending inventory must be \$100,000 (\$800,000 - \$700,000).

This procedure for determining the ending inventory under the gross profit method can be rearranged and restated as follows:

Beginning Inventory		\$200,000	
Purchases		<u>600,000</u>	
Cost of Goods Available for Sale		\$800,000	Estimate #1
Sales	\$1,000,000		
- Estimated Gross Profit (= 30% of Sales)	<u>\$(300,000)</u>		Estimate #2
= Cost of Goods Sold		(700,000)	
Ending Inventory		\$100,000	Estimate #3

Either approach produces the same result, but it may be a bit easier for you to understand what is happening if you use the first approach.

D. **Retail Method**

1. The cost of goods available for sale in the current period can be determined very accurately, since the accounting system does have balances for *Beginning Inventory* and the current period's *purchases* will have been recorded. If the **retail sales value** of these goods is also known, then the *Sales* account balance may be subtracted from the retail value of the merchandise available for sale to determine the ending inventory at retail. This figure is then multiplied by the **cost ratio** (cost of goods available for sale at cost divided by the retail value of these goods) to arrive at estimated inventory at cost.

$$\text{Cost Ratio} = \frac{\text{Cost of Merchandise Available for Sale}}{\text{Retail Sales Value of Merchandise Available for Sale}}$$

2. This method is only as good as the cost ratio estimate, which is determined from the estimated retail value of the beginning inventory and the cost of the goods purchased. Since the markup for the current period is likely known with some certainty, this cost ratio is likely to be relatively accurate. Therefore, because the gross profit ratio is normally just an average of the values from several periods, and since the cost ratio is derived from actual data from the current period, the retail method will normally provide the better estimate for the ending inventory balance.

Here's another example! Let's return to the information given in the gross profit method illustration above. James Company knows that its beginning inventory was \$200,000, that it made purchases of \$600,000 during the accounting period, and that the sales made during the period were \$1,000,000. Suppose that James' accountant knows that on average a 40% markup was applied to the inventory to determine retail selling price. This means that the cost retail selling price of the items available for sale during the period can be calculated by multiplying their costs by 40% to determine the markup, then adding it on to cost to determine retail selling price:

	<u>Cost</u>	<u>Retail</u>
Beginning Inventory	\$200,000	\$280,000
Purchases	<u>600,000</u>	<u>840,000</u>
Cost of Goods Available for Sale	\$800,000	\$1,120,000
Cost Ratio (800,000 / 1,120,000)		<u>71.4%</u>

Once we know the cost of the goods available for sale, and their retail selling price, we can calculate the **cost ratio**. This is just the total cost divided by the total retail selling price. In our case, the cost ratio is 71.4%, which just means that the cost of the goods is equal to 71.4% of their selling price. This can now be used to calculate the cost of the ending inventory.

	<u>Cost</u>	<u>Retail</u>
Cost of Goods Available for Sale	\$800,000	\$1,120,000
Subtract Sales		(1,000,000)
Ending Inventory at Retail Selling Price		\$120,000
Multiply by Cost Ratio		<u>x 71.4%</u>
Ending Inventory at Retail Selling Price		85,680

When the period's sales are subtracted from the retail value of the goods available for sale during the period, the ending inventory at retail selling price can be determined (\$120,000). To convert this retail value back to a cost figure, we only need to multiply by the cost ratio. This will give us an estimated inventory value at cost (\$85,680).

Why are the two inventory estimates different (\$100,000 under the gross profit method versus \$85,680 under the retail method)? Because they are both estimates. Which is the better estimate? It all depends on the basic premise that underlies each method. If we do believe that gross profit this period was indeed very close to 40% of sales (the basic premise of the gross profit method), then we will have confidence in the \$100,000 estimate. If we are more confident that the average markup applied to all our goods was very close to 40% (the factor that the retail method is based upon), then we will favor the \$85,680 estimate.

VI. Inventory Management – Financial Ratios

- A. Inventory management is concerned with having enough inventory to please customers and prevent lost sales from stock-outs, but also with not having too much, which results in high inventory carrying costs.
1. The **Inventory Turnover Ratio** measures the size of the inventory relative to the company's sales levels. It is calculated as follows:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

2. The average net accounts receivable is simply the balance at the beginning of the period averaged with the balance at the end of the period: $(AR_{\text{beginning balance}} + AR_{\text{ending balance}}) / 2$.

3. The higher the turnover ratio value, the smaller the inventory is relative to the sales made during the period. This may indicate very tight, effective inventory management, or it may mean the inventory is too low and sales are being lost. It is also possible to measure the **average number of day's sales** in the inventory:

$$\text{Day's Sales in Inventory} = \frac{\text{Inventory ending balance}}{\text{Average Daily Cost of Goods Sold}}$$

or

$$\text{Day's Sales in Inventory} = \frac{\text{Inventory ending balance}}{\text{Cost of Goods Sold} / 365}$$

4. The “appropriate” number of day’s sales to hold in inventory depends on a number of factors: the nature of the inventory, the company’s strategy, the existence of competitors, etc. There is no one standard value that all firms should try to attain.
5. A current trend in management is the use of **just-in-time** inventory systems. Under *J-I-T*, inventory levels are kept at bare minimums, and inventory is purchased or produced “just in time” to fill the customer's order and make the sale. This will produce a high turnover ratio and a small number of day’s sales in inventory.

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