

# Chapters *To Go*



## Essentials of Inventory Management, Second Edition

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## Chapter 2: Inventory as Money

Why should you care about the financial aspects of inventory? Because inventory is money.

Even if you do not have a financial background, it is important to understand and appreciate that inventory information in financial statements can be useful in the operation of your business. A basic understanding of how inventory appears on the balance sheet and its impact on the income statement and cash flow statement will improve your ability to have the right item in the right quantity in the right place at the right time.

### Accounting for Inventories

The three basic types of inventory are:

1. **Raw Materials**—*raw materials inventory* is made up of goods that will be used in the production of finished products (e.g., nuts, bolts, flour, sugar).
2. **Work in Process**—*work in process inventory*, or *WIP*, consists of materials entered into the production process but not yet completed (e.g., subassemblies).
3. **Finished Goods**—*finished goods inventory* includes completed products waiting to be sold (e.g., bar stools, bread, cookies).

Most inventory fits into one of these general buckets, yet the amount of each category varies greatly depending on the specifics of your industry and business. For example, the types of inventory found in distribution environments are fundamentally different from those found in manufacturing environments. Distribution businesses tend to carry mostly finished goods for resale, while manufacturing companies tend to have less finished goods and more raw materials and work in progress. Given these differences, it is natural that the accounting choices vary between distribution and manufacturing settings.

### How Inventory Is Valued

To assign a cost value to inventory, you must make some assumptions about the inventory on hand. Under federal income tax laws, a company can only make these assumptions once per fiscal year. Tax treatment is often an organization's chief concern regarding inventory valuation. The five common inventory valuation methods are as follows:

1. **First-in, First-out (FIFO)** inventory valuation assumes that the first goods purchased are the first to be used or sold regardless of the actual timing of their use or sale. This method is most closely tied to actual physical flow of goods in inventory. See [Exhibit 2-1](#).
2. **Last-in, First-out (LIFO)** inventory valuation assumes that the most recently purchased/acquired goods are the first to be used or sold regardless of the actual timing of their use or sale. Since items you have just bought often cost more than those purchased in the past, this method best matches current costs with current revenues. See [Exhibit 2-1](#).
3. **Average Cost Method** of inventory valuation identifies the value of inventory and cost of goods sold by calculating an average unit cost for all goods available for sale during a given period of time. This valuation method assumes that ending inventory consists of all goods available for sale. See [Exhibit 2-2](#).

**Average Cost = Total Cost of Goods Available for Sale ÷ Total Quantity of Goods Available for Sale**

4. **Specific Cost Method** (also **Actual Cost Method**) of inventory valuation assumes that the organization can track the actual cost of an item into, through, and out of the facility. That ability allows you to charge the actual cost of a given item to production or sales. Specific costing is generally used only by companies with sophisticated computer systems or reserved for high-value items, such as artwork or custom-made items.
5. **Standard Cost Method** of inventory valuation is often used by manufacturing companies to give all of their departments a uniform value for an item throughout a given year. This method is a “best guess” approach based on known costs and expenses, such as historical costs and any anticipated changes coming up in the foreseeable future. It is not used to calculate actual net profit or for income tax purposes. Rather, it is a working tool more than a formal accounting approach.

### Exhibit 2-1: FIFO vs. LIFO vs. Average Cost Method of Inventory Valuation Example

Assume the following inventory events:

- November 5      Purchased 800 widgets at \$10.00/unit—Total cost \$8,000
- November 7      Purchased 300 widgets at \$11.00/unit—Total cost \$3,300
- November 8      Purchased 320 widgets at \$12.25/unit—Total cost \$3,920
- November 10     Sold 750 units of goods at \$15.00/unit
- November 14     Sold 460 units of goods at \$15.55/unit
- November 15     Purchased 200 widgets at \$14.70/unit—Total cost \$2,940
- November 18     Sold 220 units of goods at \$14.45/unit

Basic Events:

UNITS PURCHASED			
Date	# Units	Cost/Unit	Cost
11/5	800	\$10.00	\$8,000
11/7	300	11.00	3,300
11/8	320	12.25	3,920
11/15	200	14.70	2,940
Total	1,620	N/A	\$18,160

UNITS SOLD			
Date	# Units	Cost/Unit	Cost
11/10	750	Varies By	
11/14	460	Valuation	
11/18	220	Method	
Total	1,430	N/A	N/A

Basic Events				FIFO Method of Accounting			
Units Purchased				Units Sold			
Date	# Units	Cost/Unit	Total Cost	# Units	Cost/Unit	Total Cost	Ending Inventory # Units    Total Cost
11/5	800	\$ 10.00	\$ 8,000				800    \$ 8,000
11/7	300	11.00	3,300				1,100    11,300
11/8	320	12.25	3,920				1,420    15,220
11/10				750	\$ 10.00	\$ 7,500	670    7,720
11/14				50	10.00	500	620    7,220
				300	11.00	3,300	320    3,920
				110	12.25	1,348	210    2,573
11/15	200	14.70	2,940				410    5,513
11/18				210	12.25	2,573	200    2,940
				10	14.70	147	190    2,793

LIFO Method of Inventory Valuation:

Basic Events				LIFO Method of Accounting			
Units Purchased				Units Sold			
Date	# Units	Cost/Unit	Total Cost	# Units	Cost/Unit	Total Cost	Ending Inventory # Units    Total Cost
11/5	800	\$ 10.00	\$ 8,000				800    \$ 8,000
11/7	300	10.25	3,075				1,100    11,075
11/8	320	9.85	3,152				1,420    14,227
11/10				320	\$ 9.85	\$ 3,152	1,100    11,075
				300	10.25	3,075	800    8,000
				130	10.00	1,300	670    6,700
11/14				460	10.00	4,600	210    2,100
11/15	200	10.22	2,044				410    4,144
11/18				200	10.22	2,044	210    2,100
				20	10.00	200	190    1,900

Average Cost Method of Inventory Valuation:

Average Cost	=	Total Cost of Goods Available for Sale	+ Total Quantity of Goods Available for Sale
	=	\$18,160	+ 1,620 units
	=	\$11.21/unit	

Basic Events				Average Cost Method of Accounting			
Units Purchased				Units Sold			
Date	# Units	Cost/Unit	Total Cost	# Units	Cost/Unit	Total Cost	Ending Inventory # Units    Total Cost
11/5	800	\$ 10.00	\$ 8,000				800    \$ 8,000
11/7	300	11.00	3,300				1,100    11,300
11/8	320	12.25	3,920				1,420    15,220
11/10				750	\$ 11.21	\$ 8,407	670    813
11/14				460	11.21	5,157	210    1,656
11/15	200	14.70	2,940				410    4,586
11/18				220	11.21	2,466	190    2,130



### Exhibit 2-2: Calculating Cost of Goods Sold

	FIFO	LIFO	Avg Cost Method
Cost of Goods Purchased	\$18,160	\$18,160	\$18,160
Minus: Ending Inventory	2,793	1,900	2,130
Cost of Goods Sold	\$15,367	\$16,260	\$16,030

### Inventory on the Balance Sheet

The balance sheet shows the financial position of a company on a specific date. It provides details for the basic accounting equation: Assets = Liabilities + Equity. In other words, assets are a company's resources, while liabilities and equity are how those resources are paid for.

- Assets represent a company's resources. Assets can be in the form of cash or other items that have monetary value, including inventory. Assets are made up of (a) current assets (cash assets or assets easily convertible to cash within one year, such as accounts receivable, securities, and inventory), (b) longer term assets such as investments and fixed assets (property/plant/equipment), or (c) intangible assets (patents, copyrights, and goodwill).
- Liabilities represent amounts owed to creditors (debt, accounts payable, and lease-term obligations).
- Equity represents ownership or rights to the assets of the company (common stock, additional paid-in capital, and retained earnings).

Inventory is typically counted among a company's *current assets* because it can be sold within one year. This information is used to calculate financial ratios that help assess the financial health of the company. Note, however, that the balance sheet is not the only place that inventory plays a role in the financial analysis of the company. In fact, inventory shows up on the income statement in the form of *cost of goods sold*.

### Inventory on the Income Statement

The income statement is a report that identifies a company's revenues (sales), expenses, and resulting profits. While the balance sheet can be described as a snapshot of a company on a *specific date* (June 30, for example), the income

statement covers a *given period of time* (June 1 through June 30). The *cost of goods sold* is the item on the income statement that reflects the cost of inventory flowing out of a business.

The old saying, “it costs money to make money,” explains the cost of goods sold. You make money by using or selling inventory. That inventory costs you something. Cost of goods sold (on the income statement) represents the value of goods (inventory) sold during the accounting period. See [Exhibit 2–3](#).

### Exhibit 2-3: Sample Balance Sheet and Income Statement Balance Sheet (assumes FIFO Method of Accounting)

Assets		Liabilities and Equity	
Cash	\$5,000	Accounts Payable	\$10,000
Accounts Receivable	11,500	Notes Payable	7,500
Inventory (per FIFO method)	2793	Current Portion of Long-Term Debt	3,050
Other Current Assets	7,000	Total Current Liabilities	20,550
Total Current Assets	26,293	Long-Term Debt	30,500
Investments	1,800	Long-Term Lease Obligations	12,250
Property, Plant, & Equipment (net)	53,000	Total Liabilities	\$63,300
Deferred Charges	1,000	Shareholders' Equity	\$19,993
Patents, Goodwill	1,200	Total Liabilities and Equity	\$83,293
Total Assets	\$83,293		

Income Statement	FIFO	LIFO	Avg. Cost Method
Revenues	\$21,582	\$21,582	\$21,582
Less: Cost of Goods Sold	15,367	16,260	16,030
Gross Profit	6,215	5,322	5,552
Less: Selling, General, and Administrative Expenses	2,500	2,500	2,500
Depreciation and Amortization Expenses	1,250	1,250	1,250
Goodwill Expense	553	553	553
Profit Before Taxes	1,912	1,019	1,249
Less: Federal Income Tax (assume 40%)	765	408	500
After-Tax Income	\$1,147	\$611	\$749

### CONCLUSIONS

1. By valuing its inventory under the FIFO method of inventory valuation, this company would have earned an extra \$536 or \$398 in after-tax income than under the LIFO or Average Cost methods of inventory valuation, respectively.

2. By valuing its inventory under the LIFO method of inventory valuation, this company would pay \$357 or \$92 less in federal income taxes than under the FIFO or Average Cost methods of inventory valuation, respectively.

The value of goods that are not sold is represented by the ending inventory amount on the balance sheet calculated as:

$$\text{Ending Inventory} = \text{Beginning Inventory} + \text{Purchases} - \text{Cost of Goods Sold}$$

This information is also useful because it can be used to show how a company “officially” accounts for inventory. With it, you can back into the cost of purchases without knowing the actual costs by turning around the equation as follows:

$$\text{Purchases} = \text{Ending Inventory} - \text{Beginning Inventory} + \text{Cost of Goods Sold}$$

Or, you can figure out the cost of goods sold if you know what your purchases are by making the following calculation:

$$\text{Cost of Goods Sold} = \text{Beginning Inventory} + \text{Purchases} - \text{Ending Inventory}$$

Finally, as you sell/use inventory and take in revenue for it, you subtract the cost of the items from the income. The result is your gross profit.

## Ratio Analyses and What They Mean

Is something good or is it bad? To answer this question we often compare one thing to another. That is the definition of a “ratio”; it is an expression of how many of one item is contained within another.

Ratios can be used in the business world by selecting parts of an organization’s financial statements and comparing one set of financial conditions to another. A company’s financial statements contain key aspects of the business. By reviewing these aspects, you can determine an organization’s economic well-being. One way of reviewing these financial conditions is to compare one to another dividing one by the other. For example, if you had \$200 in cash and \$100 worth of debts, you could divide the cash (assets) by the debt (liabilities), which would result in a ratio of 2 to 1. In other words, you have twice as many assets as you do liabilities.

Ratios are useful tools to explain trends and summarize business results. Often third parties, such as banks, use ratios to determine a company’s credit worthiness. By itself, a ratio holds little meaning. However, when compared to other industry and/or company-specific figures or standards, ratios can be powerful in helping to analyze your company’s current and historical results. Companies in the same industry often have similar liquidity ratios or benchmarks, as they often have similar cost structures. Your company’s ratios can be compared to:

1. Prior period(s)
2. Company goals or budget projections
3. Companies in your industry
4. Companies in other industries
5. Companies in different geographic regions

In particular, the following three ratios are useful when assessing inventory.

### Current Ratio

The current ratio assesses the organization’s overall liquidity and indicates a company’s ability to meet its short-term obligations. In other words, it measures whether or not a company will be able to pay its bills. Technically speaking, the current ratio indicates how many dollars of assets we have for each dollar of liabilities that we owe. The current ratio is calculated as follows:

#### **Current Ratio = Current Assets ÷ Current Liabilities**

*Current Assets* refers to assets that are in the form of cash or that are easily convertible to cash within one year, such as accounts receivable, securities, and inventory. *Current Liabilities* refers to liabilities that are due and payable within twelve months, such as accounts payable, notes payable, and short-term portion of long-term debt.

Standards for the current ratio vary from industry to industry. Companies in the service industry that carry little or no inventory typically have current ratios ranging from 1.1 to 1.3—that is, \$1.10 to \$1.30 in current assets for each dollar of current liabilities. Companies that carry inventory have higher current ratios. Manufacturing companies are included in this latter group and often have current ratios ranging from 1.6 to 2.0; not only do they have inventory in the form of finished goods ready for sale, but they also carry inventory of goods that are not yet ready for sale. Generally speaking, the longer it takes a company to manufacture the inventory and the more inventory it must keep on hand, the higher the current ratio.

#### **What the Current Ratio Might Mean**

A low current ratio may signal that a company has liquidity problems or has trouble meeting its short- and long-term obligations. In other words, the organization might be suffering from a lack of cash flow to cover operating and other expenses. As a result, accounts payable may be building at a faster rate than receivables. Note, however, that this is only an indicator and must be used in conjunction with other factors to determine the overall financial health of an organization. In fact, some companies can sustain lower-than-average current ratios because they move their inventory quickly and/or are quick to collect from their customers. Therefore, these companies have good cash flow.

A high current ratio is not necessarily desirable. It might indicate that the company is holding high-risk inventory or may be

doing a bad job of managing its assets. For example, fashion retailers may have costly inventory, but they might also have significant trouble getting rid of the inventory, for example, if the wrong clothing line was selected. This makes it a high-risk company, forcing creditors to require a bigger financial cushion.

Further, if a high current ratio is a result of a very large cash account, it may be an indication that the company is not reinvesting its cash appropriately. Even if the current ratio looks fine, other factors must be taken into consideration, as liquidity problems might still exist. Since ratios look at quantity, not quality, it is important to look at what the current assets consist of to determine if they are made up of slow-moving inventory. To assess inventory's impact on liquidity, another test of liquidity should be taken into account, such as the Quick Ratio (or Acid Test).

### Quick Ratio or Acid Test

The quick ratio compares the organization's most liquid current assets to its current liabilities. The quick ratio is calculated as follows:

$$\text{Quick Ratio} = (\text{Current Assets} - \text{Inventories}) \div \text{Current Liabilities}$$

Assume that an industry that sells on credit has a quick ratio of at least 0.8. In other words, the company has at least 80¢ in liquid assets (likely in the form of accounts receivable) for every \$1 of liabilities. Industries that have significant cash sales (such as grocery stores) tend to be even lower. As with the current ratio, a low quick ratio is an indicator of cash flow problems, while a high ratio may indicate poor asset management, as cash may be properly reinvested or accounts receivable levels are out of control. An organization's ability to promptly collect its accounts receivable has a significant impact on this ratio. The quicker the collection the more liquidity it has.

### Inventory Turnover Ratio

The inventory turnover ratio measures, on average, how many times inventory is replaced over a period of time. In its simplest sense, an inventory turn occurs every time an item is received, is used or sold, and then is replaced. If an SKU came in twice during the year, was used/sold, and then replenished, that would be two turns per year. If this happened once per month, it would be twelve turns per year, and so forth.

Inventory turnover is an important measure since the ability to move inventory quickly directly impacts the company's liquidity. Inventory turnover is calculated as follows:

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

Essentially, when a product is sold, it is subtracted from inventory and transferred to cost of goods sold. Therefore, this ratio indicates how quickly inventory is moving for accounting purposes. It does not necessarily reflect how many times actual physical items were handled within the facility itself. This is true because the cost of goods sold number may include items you sold but never physically handled. For example, items that we purchase and then have drop shipped directly at our customer's site are never handled within our facility. A more accurate measure of how many times actual physical inventory turned within the site would be:

$$\text{Actual Physical Inventory Turnover Ratio} = \text{Cost of Goods Sold from Inventory Only} \div \text{Average Inventory}$$

Note that if the inventory has increased or decreased significantly during the year, the average inventory for the year may be skewed and not accurately reflect your turnover ratio going forward. In addition, if the company uses the LIFO method of accounting, the ratio may be inflated because LIFO may undervalue the inventory.

Unlike the current ratio and quick ratio, the inventory turnover ratio does not adhere to a standard range. Organizations with highly perishable products can have inventory turns 30 times a year or more. Companies that retain large amounts of inventory or that require a long time to build their inventory might have turns only two or three times a year. In general, the overall trend in business today is to reduce carrying costs by limiting the amount of inventory in stock at any given time. As a result, both individual inventory turnovers and industry averages in this area have increased in recent years.

It is important to understand, however, that many factors can cause a low inventory turnover ratio. The company may be holding the wrong type of inventory, its quality may be lacking, or it may have sales/marketing issues.

### Profit Margins

Another set of ratios a stockkeeper must understand, especially one in a for-profit environment, are those relating to profit margins.



*Profit margins* are ratios of profitability that measure how much out of every dollar of sales a company actually keeps in earnings. If a company's expenses increase more quickly than sales, then even though sales might be higher than sales during the same time period last year, its profit margins will go down. Basically, business owners use gross profit margins to:

- Set prices at levels that ensure a strong profit, or
- Measure and reduce costs for better profitability, or
- Determine what to charge for a new item to make it profitable.

**Calculating Gross Profit**

*Gross profit* is the amount you have after you subtract all costs associated with a sale. To understand gross profit, it is important to know the distinction between *variable* and *fixed* costs. See [Exhibit 2-4](#).

**Exhibit 2-4: Variable and Fixed Costs**

<p><i>Variable costs</i> are those that change based on the amount of product being made and are incurred as a direct result of producing the product. Variable costs include:</p>	<ul style="list-style-type: none"><li>▪ Materials used</li><li>▪ Direct labor</li><li>▪ Packaging</li><li>▪ Freight</li><li>▪ Plant supervisors' salaries</li><li>▪ Utilities for a plant or warehouse</li><li>▪ Depreciation expense on production equipment and machinery</li></ul>
<p><i>Fixed costs</i> generally are more static in nature. They include:</p>	<ul style="list-style-type: none"><li>▪ Office expenses, such as supplies, utilities, telephones, and computers</li><li>▪ Salaries and wages of office staff, salespeople, and officers and owners</li><li>▪ Payroll taxes and employee benefits</li><li>▪ Advertising, promotional, and other sales expenses</li><li>▪ Insurance</li><li>▪ Auto expenses for salespeople</li><li>▪ Professional fees</li><li>▪ Rent</li></ul>
<p><i>Variable expenses</i> are recorded as cost of goods sold. <i>Fixed expenses</i> are counted as operating expenses (sometimes called selling and general and administrative expenses)</p>	

To figure out your gross profit margin, you first need to calculate your gross profit. The formula for gross profit is:

**Gross Profit = Sales – Cost of Goods Sold**

*Cost of goods sold* (COGS) includes only the direct cost incurred to manufacture or sell a product.

COGS includes items:

- purchased for resale or



- used to manufacture a product (as well as the direct labor cost to produce the product).

COGS does not include operating expenses such as office rent, office utilities, and indirect labor.

By itself, gross profit doesn't mean much. However, by using it to calculate the *gross profit margin*, you can use it to spot profitability trends over time. The formula for gross profit margin is:

**Gross Profit Margin = Gross Profit ÷ Sales × 100%**

*Example*

Company X has gross sales for 2009 equaling \$5 million. The cost of goods sold amounts to \$1.2 million. What is the gross profit margin?

**Gross Profit Margin = (5,000,000 – 1,200,000) ÷ 5,000,000**

**Gross Profit Margin = 3,800,000 ÷ 5,000,000**

**Gross Profit Margin = 76%**

Company X has gross sales for 2010 equaling \$5.5 million. The cost of goods sold amounts to \$1.4 million. What is the gross profit margin?

**Gross Profit Margin = (5,500,000 – 1,400,000) ÷ 5,500,000**

**Gross Profit Margin = 4,100,000 ÷ 5,500,000**

**Gross Profit Margin = 74%**

*So what:* Companies that have a high gross profit margin have greater cash flow; and, those with stable or increasing gross profit margins are more profitable than those whose gross profit margins fluctuate wildly or decrease over time. In the example, although Company X had greater sales from one year to the next, its gross profit margin fell, indicating an increase in costs. If this trend continues, the company will be in trouble.

You should calculate gross profit margin when you review your monthly and quarterly financial statements because even if all costs are covered and net income is strong and growing, changes in gross profit margin can serve as early signs that an increase in COGS is eroding your profitability.

Gross profit margins for a given business can also be compared to the gross profit margins common in that industry to determine how the enterprise is doing. Don't compare one industry to another. Why? Because it is common in some industries to sell large quantities of goods at a low gross profit margin, while in others smaller quantities at larger gross profit margins are more normal.

You can use a combination of approaches to increase your business's gross profit margins, including:

- Increase the number of units sold (sales volume).
- Reduce elements of COGS, for example, by substituting less expensive materials and automating to use less labor.
- Raise prices. Try different pricing strategies until your gross profit margin reaches the desired level. See [Exhibit 2–5](#).

**Exhibit 2-5: Pricing Strategies**

Skimming	<ul style="list-style-type: none"><li>▪ A short-term profit strategy. Skimming means charging a relatively high price for a short time when a new, innovative, or much-improved product is brought to market.</li><li>▪ The idea is to “skim off” customers who are willing to pay a premium price to obtain the item right away.</li><li>▪ This strategy works well for “conspicuous” or “prestige items,” such as a new type of electronic device.</li><li>▪ Prices are lowered later when demand from the early buyers falls.</li></ul>
Market Penetration Pricing	<ul style="list-style-type: none"><li>▪ Short-term profit strategy—selling at the lowest possible price for a short-term period.</li></ul>

	<ul style="list-style-type: none"> <li>Often used to introduce a new product or business with an expected long-term life cycle.</li> </ul>
<i>Loss Leader Pricing</i>	<ul style="list-style-type: none"> <li>Purposely pricing some products at a level that eliminates profit.</li> <li>Done to increase customer traffic.</li> </ul>
<i>Price Lining</i>	<ul style="list-style-type: none"> <li>Grouping products at certain price points (e.g., all items for \$9.99).</li> <li>Makes shopping easy for the consumer and averages out desired markup.</li> </ul>
<i>Price Bundling</i>	<ul style="list-style-type: none"> <li>Selling a product in multiple units (e.g., "Two for the price of one" or "Buy three and receive one free").</li> </ul>
<i>Status Quo Pricing</i>	<ul style="list-style-type: none"> <li>Price levels are firmly established and remain relatively fixed until something happens in the marketplace that requires a change or adjustment.</li> </ul>

## Merchandising Metrics

Stockkeepers, especially those in for-profit enterprises, often must be concerned with setting the right price for an item or a grouping of items. Or, they must determine the cost of an item.

### Pricing Generally

Price setting begins with determining the *breakeven point*.

- The *breakeven point* is reached when the cost of producing/purchasing and/or selling a product or service is covered.
- The *contributing margin* is the gross profit derived from the sale of the product, that is, the selling price less the cost of the goods or materials.

<b>Selling Price</b>	–	<b>Cost of Goods</b>	=	<b>Contributing Margin</b>
\$10		\$6		\$4

### Breakeven Formula

At the breakeven point, the revenue and the total cost are equal.

<b>Fixed Costs</b>	÷	<b>Contributing Margin</b>	=	<b>Breakeven Point</b>
\$100,000	÷	\$4	=	25,000 Units

### Selling Price

Price determination, the selling price, for many consumer products is often a function of the cost of production and a desired level of markup.

### Margins, Markups, and Markdowns

A *profit margin* is different than a *markup*. The *margin* is the percentage of the final selling price that is profit. A *markup* is what percentage of the cost price you add to the cost price to get the selling price. A *markdown* is the difference between the original selling price and the price at which an item is actually sold.

A selling price with a margin of 25% results in more profit than a selling price with a markup of 25%. For example, if you buy an item for \$100 and mark it up 25%, it would sell for \$125. However, if you want to make a 25% (profit) margin it would sell for \$133.33.

### Determining the Selling Price

To calculate the *selling price at a percent margin when the cost is known*, divide the cost by 100 percent minus the desired margin percent.

### **Cost ÷ (100% – Markup Percent) = Selling Price**

*Example:*

#### **Cost + (100% – Markup Percent) = Selling Price**

\$5	+	(100% – 50%)	=	\$10
\$5	+	(100% – 40%)	=	\$8.33
\$5	+	(100% – 20%)	=	\$6.25

A quicker way to work it out is to divide the cost by the profit margin you want to make. For example:

**For a 5% margin, divide the cost price by 0.95**

**For a 10% margin, divide the cost price by 0.9**

**For a 15% margin, divide the cost price by 0.85**

**For a 20% margin, divide the cost price by 0.8**

**For a 25% margin, divide the cost price by 0.75**

**For a 30% margin, divide the cost price by 0.7**

*Example:*

**For a 50% profit: \$5 + .5 = \$10**

**For a 40% profit: \$5 + .6 = \$8.33**

**For a 20% profit: \$5 + .8 = \$6.25**

#### **Determining the Cost**

To calculate the *cost when the selling price and the markup percent are known*, multiply the selling price by the markup percent and subtract the answer from the selling price.

$$(\text{Selling Price} \times \text{Markup Percent}) - \text{Selling Price} = \text{Cost}$$

*Example*

(\$10 Selling Price × 40% Markup Percent)	=	\$4 Markup
\$10 Selling Price – \$4 Markup	=	\$6 Cost

#### **Determining the Margin Percent**

To determine the *margin percent when the cost and the selling price are known*, subtract the cost from the selling price. Divide the difference by the selling price.

$$(\text{Selling Price} - \text{Cost}) \div \text{Selling Price} = \text{Margin Percent}$$

*Example*

$$\text{\$10 Selling Price} - \text{\$6 Cost} = \text{\$4 Profit}$$

$$\text{\$4} \div \text{\$10} = 0.4 \text{ or } 40\% \text{ Margin}$$

#### **Determining Markdowns (on Sale Price)**

Sometimes an item does not sell at the desired price. You must then sell it at a *markdown*. In other words, you're going to put the item "on sale."

To determine the *marked-down (on-sale) price where the original price and the markdown percent are known*, multiply the original price by the markdown percent. Subtract the answer from the original price.

**Original Price – (Original Price × Percent Markdown) = On-Sale Price**

Example

**\$10 Original Price × 15% Markdown) = \$1.50 Markdown**

**\$10 Original Price – \$1.50 Markdown = \$8.50 Sale Price**

**Determining Net Operating Profit Before Taxes**

A measure of a company’s profitability is its *net operating profit*. Net operating profit is the profitability of a company after accounting for cost of goods sold and operating expenses. Operating profit does not include expenses such as interest and taxes. See [Exhibit 2–6](#). It also doesn’t depend on capital structure or one-time expenses. So, it really does measure how well an enterprise is doing.

**Exhibit 2-6: Calculating Net Operating Profit Before Taxes**

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The profit and expense for each dollar sold is calculated as follows:

Sales price	\$1.00
Cost of Product	– 0.50
Freight Cost	<u>– 0.02</u>
Gross Profit	0.48
Operating Expenses	<u>– 0.34</u>
Net Operating Profit Before Taxes	0.14

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**Obsolete Stock**

Any stockkeeper who has had to repeatedly move really slow moving or outright dead stock out of the way or finds herself hurting for space because obsolete product eats up square foot after square foot knows that these items “just gotta go.”

**Why you Have Been Told not to Dispose of Obsolete Stock**

Why is the dead stock still here? The three reasons most often given as to why the product can’t be disposed of are:

- 1. It’s already paid for.
- 2. We might use it someday.
- 3. We might sell it someday.

These explanations seem logical, and the idea of throwing away dead stock may be counterintuitive. However, there are some very real practical problems with simply hauling it off to the dumpster.

**Problems with Convincing Decision Makers that “its Gotta Go”**

Decision makers often have difficulty with disposing of dead inventory because it will adversely impact the balance sheet and deplete resources considered to be valuable for lending purposes.

**Impact of Write-Off**

Anything that appears as an asset on the balance sheet has an accounting value. This value, consisting of an item’s original cost minus depreciation, is called the “book value.” It is irrelevant that the item may actually be worthless to either a customer or as part of a manufacturing process. If it has a one-dollar value on the books, then disposing of dead inventory has an accounting consequence to our organization.

If we sell dead inventory that has a monetary value at a deep discount, throw it away, or give it away to a charity, we will have to immediately write off the book value of those items, which will, of course, have a negative impact on the financial statements.

If your organization is sensitive to making extraordinary adjustments to the balance sheet and never or seldom writes off

dead inventory, you may have a difficult time ever convincing any decision maker to dispose of these items. The decision maker will simply not be willing to “take the hit on the books.”

### **Organization's Capital Structure**

Almost everyone has heard the expression, “cash is king.” The problem for many organizations is that cash flow doesn't always keep up with needs.

Often organizations raise operating capital by borrowing against (a) their accounts receivable and (b) the book value of the inventory they are carrying.

“Accounts receivable” are the amounts due from customers resulting from normal sales activities. Depending on the industry, banks will generally lend up to 75 percent of the value of accounts receivable due in 90 days or less.

Bankers will also lend against the book value of inventory. The willingness to lend against this asset is not as straightforward as with accounts receivable. The more complex nature of these transactions comes from the fact that in accordance with accepted accounting practices, we should value inventory at the lower of cost or fair market value. Therefore, dead stock should logically be valued at a fair market value of zero dollars no matter what it originally cost.

In spite of generally accepted accounting practices and even though parts of your inventory have no real market value (and should be valued at zero dollars), bankers will often loan your organization 50 to 60 percent of the value of the inventory as that value is shown on the books. So, companies will sometimes continue to carry dead stock so as to retain this artificial value on the books. This is an area most stockkeepers will not have any direct control over. However, the arguments below may overcome the need to keep inventory values artificially high.

### **Arguments in Favor of Disposing of Dead Stock**

Strong arguments can be made in favor of disposing of nonproductive stock, including recapture of space, better use of labor and equipment, and a reduction in the costs associated with having inventory sitting around.

#### **Recapture of Space**

In terms of space utilization, there are some simple mathematical facts to keep in mind:

- Multiplying an item's length by its width tells you the amount of square feet the item is occupying.
- Multiplying an item's length by its width by its height tells you the amount of cubic space it is occupying.

If you were to actually figure out the cubic space taken up by dead product, you would gain a powerful argument in favor of disposing of this inventory. To bolster the argument, you may want to ask your organization's financial officer how much the company is paying per square foot for rent. Multiplying the square footage being consumed by dead product by the rent per square foot often results in a truly eye-opening dollar amount. Providing actual numbers to a decision maker is far more effective than speaking in generalities, such as “dead stock is taking up a lot of space.” Pointing out that obsolete stock is “taking up 4,000 square feet” or “represents \$2,000 per month in per square foot costs” should help you convince your decision maker that “its gotta go.”

#### **Efficient Utilization of Labor and Machine Resources**

Not only does obsolete inventory take up a lot of space, it can also get in the way of workers. Repeatedly moving obsolete product out of the way hurts efficient use of both labor and machine time.

Too often, in trying to argue against keeping obsolete stock, stockkeepers will state generalities, such as “it takes us a lot of time to move that stuff around.” How long is “a lot of time”? Is it an hour a day, four hours per week? Without specific numbers, your arguments will sound hollow.

As many business writers have noted, “You cannot control what you do not measure.” There are two things you need to do to get specific time and dollar amounts:

- During each week for one month, every time you or your staff move dead product out of the way, measure the amount of direct labor that goes into that effort. Remember, if two workers are working together to move the items and they work for fifteen minutes, that represents fifteen minutes times two, or thirty minutes of direct labor.
- At the end of the month, divide the total amount of labor hours by four to determine a weekly average. To determine the amount of yearly labor involved in moving dead stock, multiply the weekly average times the number of weeks in a year

your company operates.

Once again, obtain base information from your financial officer and multiply the average hourly wage you pay your workers, including benefits, by the annual labor number. The result will make a rather impressive argument as to how the organization can save thousands of dollars per year by disposing of its dead stock.

**Reduction of Carrying Costs (K Factor)**

The K Factor represents the number of pennies per inventory dollar per year a company is spending to house its inventory. It is generally expressed as a percentage. In other words, a K Factor of 25 percent means that you are spending 25¢ per inventory dollar per year to house your inventory. A \$1 dead item that sits on your shelf for a year would cost you 25¢ that year, a total of 50¢ at the end of the second year, a total of 75¢ at the end of the third year, and so on.

There are two ways of computing the K Factor—a traditional method in which you add together various expenses directly related to carrying inventory and a rough rule-of-thumb method. See [Exhibit 2–7](#).

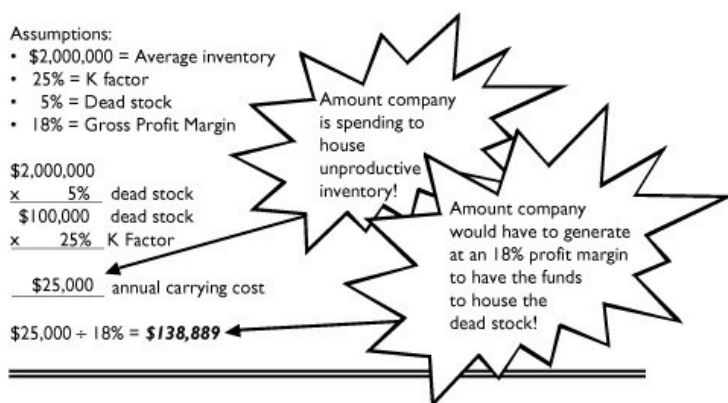
**Exhibit 2-7: Methods of Determining the Cost of Carrying Inventory**

Traditional Accounting Method		Rule-of-Thumb Method
Warehouse Space	\$130,000	20% + Prime Lending Rate = K Factor
Taxes	65,000	
Insurance	40,000	
Obsolescence/Shrinkage	23,000	
Material Handling	64,800	
Cost of Money Invested	200,000	
Total Annual Costs	\$522,800	
<div>Total Annual Costs = <math>\frac{\\$522,800}{\text{Avg Inventory Value} = \\$2,000,000}</math> = 26% K Factor</div>		

Since it always costs something to carry inventory, it is obvious that the longer dead stock remains in your facility, the more it will cost. Two approaches can be used to effectively argue this point:

- 1. Demonstrate the impact of carrying costs on your existing dead stock. This addresses the “We’ve already paid for it,” argument in favor of retaining dead stock. See [Exhibit 2–8](#) and [Exhibit 2–9](#).
- 2. Demonstrate that if the product remains long enough, even selling it at a profit will not Recapture your original cost. This addresses the “We might need it someday” and “We might sell it someday” arguments in favor of retaining dead stock. See [Exhibit 2–10](#).

**Exhibit 2-8: Demonstrating the Impact of the K Factor on Existing Dead Stock**



## Exhibit 2-9: Creating an Inventory Analysis Report Listing Dead Stock

SKU #	DESCRIPTION	QUANT ON HAND	UNIT COST	DOLLAR VALUE OF PRODUCT IN-HOUSE	MONTHLY USAGE	PROJECTED ANNUAL USAGE	MONTHS SUPPLY ON HAND

## Exhibit 2-10: Demonstrating the Impact of the K Factor on Items Sold at a Profit but after Remaining in Stock for Long Periods of Time

Assumptions:

- 720 pairs of earmuffs purchased at \$2.25 per pair (\$1,620 original cost)
- Earmuffs have remained unsold for 2 years
- We hope to sell at a 30% gross profit per pair (\$2.93 pair)
- 25% K factor

$\$1,620 \times 25\% = \$405$  per year in carrying cost

$\$405 \div 720$  pairs = 56¢ per year, per pair in additional carrying cost expense

Additional cost after one year:

$\$2.25 + \$0.56 = \$2.81/\text{pair}$  ( $720 \text{ pairs} \times \$2.81/\text{pair} = \$2,023$ )

Additional cost after two years:

$\$2.81 + \$0.56 = \$3.37/\text{pair}$  ( $720 \text{ pairs} \times \$3.37/\text{pair} = \$2,426$ )

Costs are going up \$0.002 per day ( $\$0.56 \div 365 \text{ days/yr}$ )

\$2.93 sales price

–2.25 original cost

\$0.68 gross profit expected

$\$0.68 \div \$0.002 = \text{breakeven at 340 days—after 340 days there is no profit at all!}$



Original cost: \$2,500

Cost including carrying costs after two years:  
\$4,449 (\$2,023 + \$2,426)

Revenue from selling earmuffs at \$2.93/pair: \$2,110  
(\$2.93/pair × 720 pairs)

*Loss on sale made after inventory has been in-house for two years even though sale made at 30% gross profit on original cost: \$2,339*

---

In [Exhibit 2–8](#) a percentage is used to indicate the amount of dead stock in the facility. Note, however, it is always more convincing to a decision maker if you use actual lists and dollar amounts to demonstrate those items that are dead rather than using a generality like a rough percentage. See [Exhibit 2–9](#).

## Methods of Disposal

Various approaches to disposing of dead stock exist:

- Sell at net price
- Temporarily raise commissions for salespeople
- Discount the price
- Return to vendor
- Donate it
- Write it off
- Auction

It is important to remember something about convincing decision makers of anything. Ordinarily, when reports or other information flow up a chain of command, the level of detail at each level decreases. Generally, each higher level of management wants to see less and less information with which to make decisions. You should resist providing only minimal data in making arguments regarding dead stock. This is a time to let the details do the talking.

## Carrying Cost and Purchasing

Although you should only have the minimum amount of inventory on hand required for either production or distribution, be careful not to purchase small quantities over and over again. Buying small amounts frequently will lead to an excessive cost of replenishment (the “R Factor”).

A simple example of how an excessive R Factor can be created would be the following:

### *Example*

#### *Assumptions:*

It costs a certain amount of money per line item, per purchase order to buy something. Assume \$2.59 per line item, per purchase order for this example.

You Purchase 1 million widgets per year.

If you bought all 1 million widgets at one time, the R Factor would be \$2.59, since there was only one purchase order with one line item on it.

If you bought 250,000 widgets at a time, the R Factor would be \$10.36. That is because you would have four purchase orders with one line item each at a cost of \$2.59 each.

If you bought 1 million widgets one at a time at an R Factor of \$2.59 each the replenishment cost would be \$2,590,000!

Because of the R Factor, modern purchasing dictates that you buy larger quantities on fewer purchase orders, but with suppliers releasing items on a prearranged schedule or on demand.

Ultimately, the point at which your cost of carrying inventory matches the cost of purchasing it is the proper economic order quantity of that item. See “Replenishment Costs” in Chapter 5, Planning and Replenishment Concepts.

### Recap

The objective of this chapter was to provide you with highlights of the most basic accounting concepts you, as a stockkeeper, must understand to successfully discuss and plan inventory values with your colleagues.

Although you may never participate in the preparation of month- or year-end financial statements, it is in your own self-interest to review these statements and think about how the inventory values reflected impact your operation.

Also, regular, detailed examination of your gross profit margin and how its components change over time can assist you in highlighting opportunities for improvement in operations and profitability.

And finally, whenever discussing either buying more stock or getting rid of dead stock, it is always more persuasive to use actual numbers than to deal in generalities. Remember, “if you can measure it, you can control it.”

### Review Questions

1. A balance sheet is best described as:

?

- a. A report that identifies a company’s revenues (sales), expenses, and resulting profits for a given period of time.
- b. A report that shows the financial position of a company on a specific date.
- c. A report that shows the relationship between inventory on hand and on order.
- d. A report that identifies the number of items per level and number of tiers of product on a pallet.

2. An income statement is best described as:

?

- a. A report that identifies a company’s revenues (sales), expenses, and resulting profits for a given period of time.
- b. A report that shows the financial position of a company on a specific date.
- c. A report that shows the relationship between inventory on hand and on order.
- d. A report that identifies the number of items per level and number of tiers of product on a pallet.

3. True or False

?

The K Factor represents the number of pennies per inventory dollar per year a company is spending to house its inventory.

- a. True
- b. False

4. True or False

?

The K Factor is generally expressed as a percentage.

- a. True
- b. False

5.  $\text{Current Assets} \div \text{Current Liabilities}$  is the formula for which ratio?

?

- a. Inventory Turn Ratio
- b. Current Ratio
- c. Quick Ratio

## Answers

1. (b)

2. (a)

3. (a)

4. (a)

5. (b)