A Look Back

Chapter 5 looked at cost behavior and its use by managers in performing cost-volume-profit analysis. It also illustrated the application of cost-volume-profit analysis.

A Look at This Chapter

This chapter describes managerial accounting reports that reflect variable costing. It also compares reports prepared under variable costing with those under absorption costing, and it explains how variable costing can improve business decisions.

A Look Ahead

Chapter 7 introduces and describes the budgeting process and its importance to management. It also explains the master budget and its usefulness to the planning of future company activities.

Chapter 6

Variable Costing and Performance Reporting

Learning Objectives

CAP

Conceptual

- C1 Distinguish between absorption costing and variable costing. *(p. 206)*
- C2 Describe how absorption costing can result in over-production. *(p. 213)*
- C3 Explain the role of variable costing in pricing special orders. *(p. 215)*

Analytical

- A1 Analyze income reporting for both absorption and variable costing. *(p. 208)*
- A2 Compute and interpret break-even volume in units. *(p. 217)*

Procedural

- P1 Compute unit cost under both absorption and variable costing. *(p. 207)*
- P2 Prepare an income statement using absorption costing and using variable costing. *(p. 209)*
- P3 Prepare a contribution margin report. *(p. 209)*
- P4 Convert income under variable costing to the absorption cost basis. *(p. 213)*

Decision Feature

Fancy Pants

"We want guys to wear pants that not everyone in the world will have"—Andy Dunn

NEW YORK—Brian Spaly didn't like his pants. High-end pants were too expensive, the fit was too tight, and he felt that mass market pants were boring. So, Brian borrowed a sewing machine, learned how to sew, and began designing his own pants. "I had no idea what I was doing," admits Brian. "But it turns out it's not that complicated." Brian's business college classmates took note of his new pants and asked if he could make some for them. After a 'small production run' and a few samples, the word got out and Brian's company, **Bonobos (Bonobos.com)** was born—the company name comes from the bonobo chimpanzee, known for its peaceful and friendly nature.

Brian soon teamed with a buddy, Andy Dunn, and their focus became "fashionable pants for real guys." Their strategy was multi-faceted: pants that fit; pants in unconventional colors such as hunter orange and mountain turquoise; pants with funky names such as *Orange Crush, Spider Fighters*, and *Tequila.* A one-day sale from their apartment yielded sales of 47 pairs, suggesting their new venture had legs. "The real question became: 'Can I design and make better pants?' Because the market needs it," insists Brian. "There is no one else doing it, so I gotta do it."

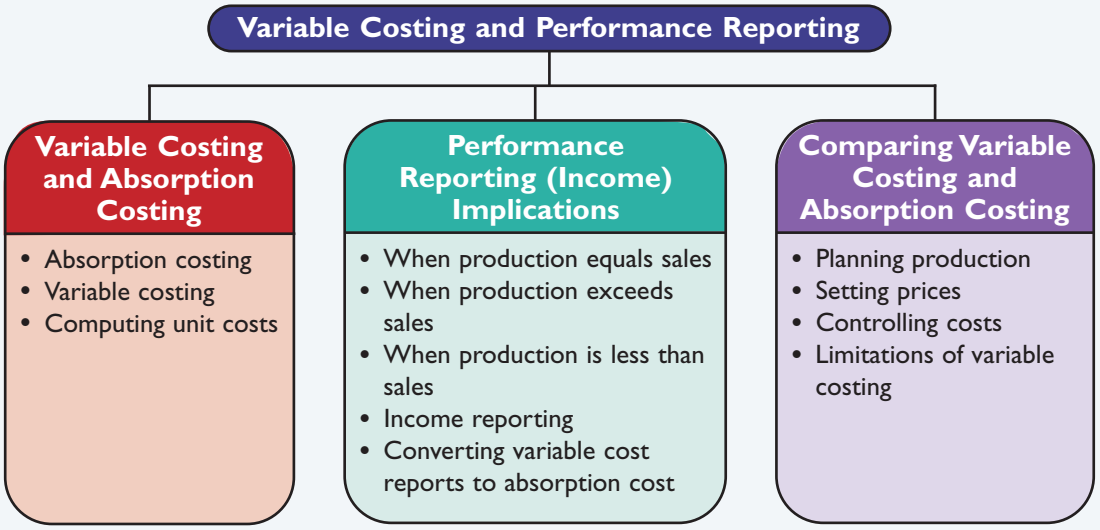
Bonobos' business model is unique: All Bonobos pants are handmade, and now sold only online. Further, monitoring and controlling costs are crucial to its success. Instead of trying to drive material costs down by buying in bulk, Bonobos prefers to spend whatever it takes to achieve a high level of quality and style. Bonobos often makes fifty or a hundred pairs of a certain style of pants, and then never makes that style again—adding to its distinctiveness. Selling prices are set to cover the variable fabric costs of each style of pants and to yield an adequate contribution margin.

Bonobos avoids fixed costs and strives to keep costs other than materials to a minimum. Operating only online avoids the overhead costs of having retail facilities that its competitors pass on to customers. The company shuns advertising. "Our most successful marketers are guys who love our pants," explains Andy. One exception was for a line of "Cubbie" blue pants where Andy purchased a $63 self-service ad on Facebook to target Chicago Cubs fans. Within days, Bonobos sold out of the special edition pants at $120 per pair. In addition, Bonobos uses customers and friends as models to further slash costs. In essence, the variable fabric costs are what drive its decisions regarding product lines and product pricing. Accordingly, its costing system, with reports on variable costs, contribution margins, and break-even points, is key.

With a keen eye for style and a focus on quality and cost control, Bonobos continues to grow. In its first six months of operations, it sold over 2,000 pairs of pants. "We're energized and trying to make as many shorts and pants as we can," says Brian. Although the founders are having fun (such as naming their company after a chimp and with waistbands featuring tequila bottles), their goals are high. Admits Andy, "We've set out to become the go-to brand for men's pants."

[Sources: *Bonobos Website,* January 2009; *The Wall Street Journal,* May 2008; *Chicago Tribune,* June 2008; *Los Angeles Times,* May 2008; *San Francisco Chronicle,* March 2008; *Fabulmag.com,* June 2008]

Product-costing information is crucial for most business decisions. This chapter explains and illustrates the concept of variable costing. We then compare variable costing to that of absorption costing commonly used for financial reporting. We show that income is different when computed under variable or absorption costing whenever the number of units produced is different from units sold. We also show how absorption costing can be misleading (though not wrong) and how variable costing can result in better production and pricing decisions.



Introducing Variable Costing and Absorption Costing

C1 Distinguish between absorption costing and variable costing.

Product costs consist of direct materials, direct labor, and overhead. Direct materials and direct labor costs are those that can be identified and traced to the product(s). Overhead, which consists of costs such as electricity, equipment depreciation, and supervisor salaries, is not traceable to the product. Overhead costs must be allocated to products.

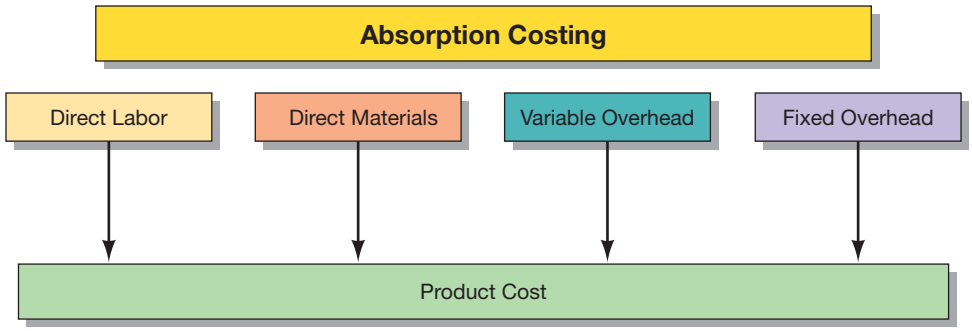
There are a variety of costing methods for identifying and allocating overhead costs to products. A prior chapter focused on *how* to allocate overhead costs to products. This chapter focuses on *what* overhead costs are included in product costs.

Under the traditional costing approach, *all* manufacturing costs are assigned to products. Those costs consist of direct materials, direct labor, variable overhead, and fixed overhead. This traditional approach is referred to as **absorption costing** (also called *full costing*), which assumes that products *absorb* all costs incurred to produce them. While widely used for financial reporting (GAAP), this costing method can result in misleading product cost information for managers' business decisions.

Under **variable costing,** only costs that change in total with changes in production level are included in product costs. Those consist of direct materials, direct labor, and variable overhead. The overhead cost that does not change with changes in production is fixed overhead—and, thus, is excluded from product costs. Instead, fixed overhead is treated as a period cost; meaning it is expensed in the period when it is incurred.

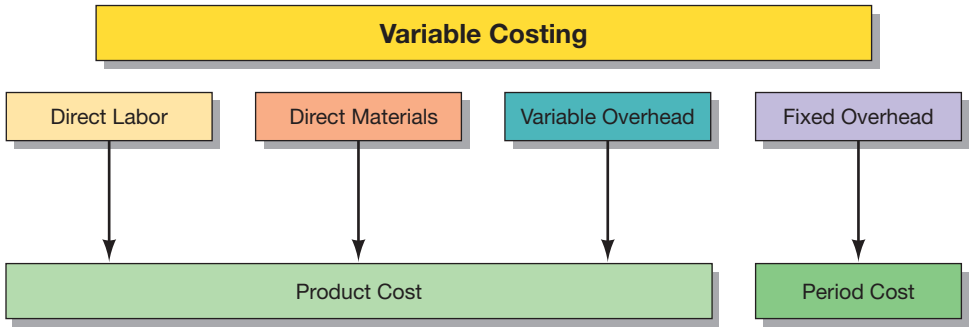
Absorption Costing

Product cost generally consists of direct materials, direct labor, and overhead. Costs of both direct materials and direct labor usually are easily traced to specific products. Overhead costs, however, must be allocated to products because they cannot be traced to product units. Under absorption costing, *all* overhead costs, both fixed and variable, are allocated to products as the following diagram shows.



Variable Costing

Under variable costing, the costs of direct materials and direct labor are traced to products, and only variable overhead costs (not fixed overhead) are allocated to products. Fixed overhead costs are treated as period costs and are reported as expense in the period when incurred.



Computing Unit Cost

P1 Compute unit cost under both absorption and variable costing.

To illustrate the difference between absorption costing and variable costing, let's consider the product cost data in Exhibit 6.1 from IceAge, a skate manufacturer.

EXHIBIT 6.1
Summary Product Cost Data

Direct materials cost	$4 per unit
Direct labor cost	8 per unit
Overhead cost	
Variable overhead cost	$ 180,000
Fixed overhead cost	600,000
Total overhead cost	$ 780,000
Expected units produced	60,000 units

Drawing on the product cost data, Exhibit 6.2 shows the product unit cost computations for both absorption and variable costing. For absorption costing, the product unit cost is $25, which consists of $4 in direct materials, $8 in direct labor, $3 in variable overhead ($180,000/60,000 units), and $10 in fixed overhead ($600,000/60,000 units).

For variable costing, the product unit cost is $15, which consists of $4 in direct materials, $8 in direct labor, and $3 in variable overhead. Fixed overhead costs of $600,000 are treated as a period cost and are recorded as expense in the period incurred. The difference between the two costing methods is the exclusion of fixed overhead from product costs for variable costing.

EXHIBIT 6.2

Unit Cost Computation

	Absorption Costing	Variable Costing
Direct materials cost per unit	$ 4	$ 4
Direct labor cost per unit	8	8
Overhead cost		
Variable overhead cost per unit	3	3
Fixed overhead cost per unit	10	—
Total product cost per unit	$25	$15

Quick Check

Answers—p. 221

1. Which of the following cost elements are included when computing unit cost under absorption costing?
   a. Direct materials b. Direct labor c. Variable overhead d. Fixed overhead
2. Which of the following cost elements are included when computing unit cost under variable costing?
   a. Direct materials b. Direct labor c. Variable overhead d. Fixed overhead

Performance Reporting (Income) Implications

A1 Analyze income reporting for both absorption and variable costing.

The prior section illustrated the differences between absorption costing and variable costing in computing unit cost. This section shows the implications of those differences for performance (income) reporting.

To illustrate the reporting implications, we return to IceAge Company. Exhibit 6.3 summarizes the production cost data for IceAge as well as additional data on nonproduction costs. Assume that IceAge's variable costs per unit are constant and that its annual fixed costs remain unchanged during the three-year period 2007 through 2009.

EXHIBIT 6.3

Summary Cost Information for 2007–2009

Production Costs		Nonproduction Costs	
Direct materials cost	$4 per unit	Variable selling and administrative expenses	$2 per unit
Direct labor cost	$8 per unit	Fixed selling and administrative expenses	$200,000 per year
Variable overhead cost	$3 per unit		
Fixed overhead cost	$600,000 per year		

The reported sales and production information for IceAge follows. Its sales price was a constant $40 per unit over this time period. We see that the units produced equal those sold for 2007, but exceed those sold for 2008, and are less than those sold for 2009.

	Units Produced	Units Sold	Units in Ending Inventory
2007	60,000	60,000	0
2008	60,000	40,000	20,000
2009	60,000	80,000	0

Drawing on the information above, we next prepare the income statement for IceAge both under absorption costing and under variable costing. Our purpose is to highlight differences between these two costing methods under three different cases: when units produced are equal to, exceed, or are less than units sold.

Units Produced Equal Units Sold

Exhibit 6.4 presents the 2007 income statement for both costing methods (2008 and 2009 statements will follow). The income statement under variable costing (on the right) is referred to as the **contribution margin income statement.** Contribution margin is the excess of sales over variable costs. This amount contributes to covering all fixed costs and earning income. Under variable costing, the expenses are grouped according to cost behavior—variable or fixed, and production or nonproduction. Under the traditional format of absorption costing, expenses are grouped according to function.

P2 Prepare an income statement using absorption costing and using variable costing.

EXHIBIT 6.4

Income for 2007—Quantity Produced Equals Quantity Sold*

ICEAGE COMPANY Income Statement (Absorption Costing) For Year Ended December 31, 2007	
Sales† (60,000 × $40)	$2,400,000
Cost of goods sold (60,000 × $25)	1,500,000
Gross margin	900,000
Selling and administrative expenses [$200,000 + (60,000 × $2)]	320,000
Net income	$ 580,000

ICEAGE COMPANY Income Statement (Variable Costing) For Year Ended December 31, 2007		
Sales† (60,000 × $40)		$2,400,000
Variable expenses		
Variable production costs (60,000 × $15)	$900,000	
Variable selling and administrative expenses (60,000 × $2)	120,000	1,020,000
Contribution margin		1,380,000
Fixed expenses		
Fixed overhead	600,000	
Fixed selling and administrative expense	200,000	800,000
Net income		$ 580,000

A performance report that excludes fixed expenses and net income is a contribution margin report.

* See Exhibit 6.2 for unit cost computation under absorption and under variable costing.

† Units produced equal 60,000; units sold equal 60,000.

Point: Contribution margin income statements prepared under variable costing are useful in performing cost-volume-profit analyses.

Exhibit 6.4 reveals that *reported income is identical under absorption costing and variable costing when the units pr oduced equal the units sold .*

Contribution Margin Report A performance report that excludes fixed expenses and net income is known as a **contribution margin report.** Looking at the variable costing income statement in Exhibit 6.4, a contribution margin report would end with the contribution margin of $1,380,000. However, a *contribution margin income statement* includes fixed expenses and net income as shown in Exhibit 6.4.

P3 Prepare a contribution margin report.

Point: Contribution margin (Sales − Variable expenses) is different from gross margin (Sales − Cost of sales).

Exhibit 6.4A reorganizes the information from Exhibit 6.4 to show the assignment of costs to different expenses and assets under both absorption costing and variable costing. When quantity produced equals quantity sold there is no difference in total costs assigned. Yet, there is a difference in what categories receive those costs. Absorption costing assigns $1,500,000 to cost of goods sold compared to $900,000 for variable costing. The $600,000 difference is a period cost for variable costing.

EXHIBIT 6.4A

Production Cost Assignment for 2007

	Cost of Goods Sold (Expense)		Ending Inventory (Asset)		Period Cost (Expense)	2007 Expense
Absorption Costing						
Direct materials	60,000 × $4	$ 240,000	0 × $4	$ 0		$ 240,000
Direct labor	60,000 × $8	480,000	0 × $8	0		480,000
Variable overhead	60,000 × $3	180,000	0 × $3	0		180,000
Fixed overhead	60,000 × $10	600,000	0 × $10	0		600,000
Total costs		$1,500,000		$ 0		**$1,500,000**
Variable Costing						
Direct materials	60,000 × $4	$ 240,000	0 × $4	$ 0		$ 240,000
Direct labor	60,000 × $8	480,000	0 × $8	0		480,000
Variable overhead	60,000 × $3	180,000	0 × $3	0		180,000
Fixed overhead					$600,000	600,000
Total costs		$ 900,000		$ 0	$600,000	**$1,500,000**
Cost difference						**$ 0**

Decision Insight

Manufacturing Margin Some managers compute *manufacturing margin* (also called *production margin*), which is sales less variable production costs. Some managers also require that internal income statements show this amount to highlight variable product costs on income. The contribution margin section of IceAge's statement would appear as follows (compare this to Exhibit 6.4).

Sales	$2,400,000
Variable production costs	900,000
Manufacturing margin	1,500,000
Variable selling & admin. exp.	120,000
Contribution margin	$1,380,000

Units Produced Exceed Units Sold

Exhibit 6.5 shows absorption costing and variable costing income statements for 2008. In 2008, 60,000 units were produced, which is the same as in 2007. However, only 40,000 units were sold.

The income statements reveal that for 2008, income is $320,000 under absorption costing. Under variable costing, income is $120,000, which is $200,000 less than under absorption costing. The cause of this $200,000 difference rests with the different treatment of fixed overhead under the two costing methods.

EXHIBIT 6.5

Income for 2008—Quantity Produced Exceeds Quantity Sold*

ICEAGE COMPANY
Income Statement (Absorption Costing)
For Year Ended December 31, 2008

Sales† (40,000 × $40)	$1,600,000
Cost of goods sold (40,000 × $25)	1,000,000
Gross margin	600,000
Selling and administrative expenses [$200,000 + (40,000 × $2)]	280,000
Net income	$ 320,000

ICEAGE COMPANY
Income Statement (Variable Costing)
For Year Ended December 31, 2008

Sales† (40,000 × $40)		$1,600,000
Variable expenses		
Variable production costs (40,000 × $15)	$600,000	
Variable selling and administrative expenses (40,000 × $2)	80,000	680,000
Contribution margin		920,000
Fixed expenses		
Fixed overhead	600,000	
Fixed selling and administrative expense	200,000	800,000
Net income		$ 120,000

* See Exhibit 6.2 for unit cost computation under absorption and under variable costing.

† Units produced equal 60,000; units sold equal 40,000.

Under variable costing, the entire $600,000 fixed overhead cost is treated as an expense in computing 2008 income. Under absorption costing, the fixed overhead cost is allocated to each unit of product at the rate of $10 per unit (from Exhibit 6.2). When production exceeds sales by 20,000 units (60,000 versus 40,000), the $200,000 ($10 × 20,000 units) of fixed overhead cost allocated to these 20,000 units is carried as part of the cost of ending inventory (see Exhibit 6.5A). This means that $200,000 of fixed overhead cost incurred in 2008 is not expensed until future periods when it is reported in cost of goods sold as those products are sold. Consequently, income for 2008 under absorption costing is $200,000 higher than income under variable costing.

Exhibit 6.5A reorganizes the information from Exhibit 6.5 to show the assignment of costs to different expenses and assets under both absorption costing and variable costing. When quantity produced exceeds quantity sold there is a difference in total costs assigned. As a result, income under absorption costing is greater than under variable costing because of the greater fixed overhead cost allocated to ending inventory (asset) under absorption costing. Those cost differences extend to cost of goods sold, ending inventory, and period costs.

EXHIBIT 6.5A

Production Cost Assignment for 2008

	Cost of Goods Sold (Expense)		Ending Inventory (Asset)		Period Cost (Expense)	2008 Expense
Absorption Costing						
Direct materials	40,000 × $4	$ 160,000	20,000 × $4	$ 80,000		$ 160,000
Direct labor	40,000 × $8	320,000	20,000 × $8	160,000		320,000
Variable overhead	40,000 × $3	120,000	20,000 × $3	60,000		120,000
Fixed overhead	40,000 × $10	400,000	20,000 × $10	200,000		400,000
Total costs		$1,000,000		$500,000		**$1,000,000**
Variable Costing						
Direct materials	40,000 × $4	$ 160,000	20,000 × $4	$ 80,000		$ 160,000
Direct labor	40,000 × $8	320,000	20,000 × $8	160,000		320,000
Variable overhead	40,000 × $3	120,000	20,000 × $3	60,000		120,000
Fixed overhead					$600,000	600,000
Total costs		$ 600,000		$300,000	$600,000	**$1,200,000**
Cost difference						**$ (200,000)**

Units Produced Are Less Than Units Sold

Exhibit 6.6 shows absorption costing and variable costing income statements for 2009. In 2009, IceAge produced 20,000 fewer units than it sold. Production equaled 60,000 units, but units sold were 80,000. IceAge's income statements reveal that income is $840,000 under absorption costing, but it is $1,040,000 under variable costing.

Point: IceAge can sell more units than it produced in 2009 because of inventory carried over from 2008.

The cause of this $200,000 difference lies with the treatment of fixed overhead. Beginning inventory in 2009 under absorption costing included $200,000 of fixed overhead cost incurred in 2008, which is assigned to cost of goods sold in 2009 under absorption costing.

EXHIBIT 6.6

Income for 2009—Quantity Produced Is Less Than Quantity Sold*

ICEAGE COMPANY
Income Statement (Absorption Costing)
For Year Ended December 31, 2009

Sales† (80,000 × $40)	$3,200,000
Cost of goods sold (80,000 × $25)	2,000,000
Gross margin	1,200,000
Selling and administrative expenses [$200,000 + (80,000 × $2)]	360,000
Net income	$ 840,000

ICEAGE COMPANY
Income Statement (Variable Costing)
For Year Ended December 31, 2009

Sales† (80,000 × $40)		$3,200,000
Variable expenses		
Variable production costs (80,000 × $15)	$1,200,000	
Variable selling and administrative expenses (80,000 × $2)	160,000	1,360,000
Contribution margin		1,840,000
Fixed expenses		
Fixed overhead	600,000	
Fixed selling and administrative expense	200,000	800,000
Net income		$1,040,000

* See Exhibit 6.2 for unit cost computation under absorption and under variable costing.

† Units produced equal 60,000; units sold equal 80,000.

Exhibit 6.6A reorganizes the information from Exhibit 6.6 to show the assignment of costs to different expenses and assets under both absorption costing and variable costing. When quantity produced is less than quantity sold there is a difference in total costs assigned.

Specifically, ending inventory in 2008 under absorption costing was $500,000 (20,000 units × $25) whereas it was only $300,000 (20,000 units × $15) under variable costing—see Exhibit 6.5A. Consequently, when that inventory is sold in 2009, the 2009 income under absorption costing is $200,000 less than the income under variable costing. That inventory cost difference flows through cost of goods sold and then to income.

EXHIBIT 6.6A

Production Cost Assignment for 2009

	Cost of Goods Sold (Expense)		Ending Inventory (Asset)		Period Cost (Expense)	2009 Expense
Absorption Costing						
Direct materials	80,000 × $4	$ 320,000	0 × $4	$ 0		$ 320,000
Direct labor	80,000 × $8	640,000	0 × $8	0		640,000
Variable overhead	80,000 × $3	240,000	0 × $3	0		240,000
Fixed overhead	80,000 × $10	800,000	0 × $10	0		800,000
Total costs		$2,000,000		$ 0		**$2,000,000**
Variable Costing						
Direct materials	80,000 × $4	$ 320,000	0 × $4	$ 0		$ 320,000
Direct labor	80,000 × $8	640,000	0 × $8	0		640,000
Variable overhead	80,000 × $3	240,000	0 × $3	0		240,000
Fixed overhead					$600,000	600,000
Total costs		$1,200,000		$ 0	$600,000	**$1,800,000**
Cost difference						**$ 200,000**

Summarizing Income Reporting

Income reported under both variable costing and absorption costing for the period 2007 through 2009 for IceAge is summarized in Exhibit 6.7. We see that the differences in income are due to timing as total income is $1,740,000 for this time period for *both* methods. Further, income under absorption costing and that under variable costing will be different whenever the quantity produced and the quantity sold are different. Specifically, *income under absorption costing is higher when more units are produced relative to units sold and is lower when fewer units are produced than are sold.*

EXHIBIT 6.7

Summary of Income Reporting

	Units Produced	Units Sold	Income Under Absorption Costing	Income Under Variable Costing	Differences
2007	60,000	60,000	$ 580,000	$ 580,000	$ 0
2008	60,000	40,000	320,000	120,000	200,000
2009	60,000	80,000	840,000	1,040,000	(200,000)
Totals	180,000	180,000	$1,740,000	$1,740,000	$ 0

Point: As companies adopt lean practices, including just-in-time manufacturing, inventory levels fall. Lower inventory levels reduce differences between absorption and variable costing income.

Our illustration using IceAge had the total number of units produced over 2007–2009 exactly equal to the number of units sold over that period. This meant that the difference between absorption costing income and variable costing income for the *total* three-year period is zero. In reality, it is unusual for production and sales quantities to exactly equal each other over such a short period of time. This means that we normally continue to see differences in income for these two methods extending over several years.

Quick Check

Answers—p. 221

3. Which of the following statements is true when units produced exceed units sold?
   a. Variable costing income exceeds absorption costing income.
   b. Variable costing income equals absorption costing income.
   c. Variable costing income is less than absorption costing income.

4. Which of the following statements is true when units produced are less than units sold?
   a. Variable costing income exceeds absorption costing income.
   b. Variable costing income equals absorption costing income.
   c. Variable costing income is less than absorption costing income.

Converting Reports under Variable Costing to Absorption Costing

P4 Convert income under variable costing to the absorption cost basis.

Companies commonly use variable costing for internal reporting and business decisions, and use absorption costing for external reporting and tax reporting. For companies concerned about the cost of maintaining two costing systems, it is comforting to know that we can readily convert reports under variable costing to that using absorption costing.

Income under variable costing is restated to that under absorption costing by adding the fixed production cost in ending inventory and subtracting the fixed production cost in beginning inventory.

Using IceAge's data, in 2008, absorption costing income was $200,000 higher than variable costing income. The $200,000 difference was because the fixed overhead cost incurred in 2008 was allocated to the 20,000 units of ending inventory under absorption costing (and not expensed in 2008 under absorption costing). On the other hand, the $200,000 fixed overhead costs (along with all other fixed costs) were expensed in 2008 under variable costing.

Exhibit 6.8 shows the computations for restating income under the two costing methods. To restate variable costing income to absorption costing income for 2008, we must add back the **fixed overhead cost deferred in** (ending) **inventory.** Similarly, to restate variable costing income to absorption costing income for 2009, we must deduct the **fixed overhead cost recognized from** (beginning) **inventory,** which was incurred in 2008, but expensed in the 2009 cost of goods sold when the inventory was sold.

EXHIBIT 6.8

Converting Variable Costing Income to Absorption Costing Income

	2007	2008	2009
Variable costing income	$580,000	$120,000	$1,040,000
Add: Fixed overhead cost deferred in ending inventory (20,000 × $10)	0	200,000	0
Less: Fixed overhead cost recognized from beginning inventory (20,000 × $10)	0	0	(200,000)
Absorption costing income	$580,000	$320,000	$ 840,000

Comparing Variable Costing and Absorption Costing

This section discusses how absorption costing can lead to undesirable production and pricing decisions and how variable costing can result in better business decisions.

Planning Production

C2 Describe how absorption costing can result in over-production.

Production planning is an important managerial function. Producing too much leads to excess inventory, which in turn leads to higher storage and financing costs, and to greater risk of product obsolescence. On the other hand, producing too little can lead to lost sales and customer dissatisfaction.

Production levels should be based on reliable sales forecasts. However over-production and inventory buildup can occur because of how managers are evaluated and rewarded. For instance, many companies link manager bonuses to income computed under absorption costing because this is how income is reported to shareholders (per GAAP).

To illustrate how a reward system can lead to over-production under absorption costing, let's use IceAge's 2007 data with one change: assume that its manager decides to produce 100,000 units instead of 60,000. Since only 60,000 units are sold, the 40,000 units of excess production will be stored in inventory.

The left side of Exhibit 6.9 shows the unit cost when 60,000 units are produced (same as Exhibit 6.2). The right side shows unit cost when 100,000 units are produced. The exhibit is prepared under absorption costing for 2007.

EXHIBIT 6.9

Unit Cost Under Absorption Costing for Different Production Levels

When 60,000 Units Are Produced		When 100,000 Units Are Produced	
Direct materials cost	$ 4 per unit	Direct materials cost	$ 4 per unit
Direct labor cost	8 per unit	Direct labor cost	8 per unit
Variable overhead cost	3 per unit	Variable overhead cost	3 per unit
Total variable cost	15 per unit	Total variable cost	15 per unit
Fixed overhead ($600,000/60,000 units)	10 per unit	Fixed overhead ($600,000/100,000 units)	6 per unit
Total product cost	$25 per unit	Total product cost	$21 per unit

Total production cost *per unit* is $4 less when 100,000 units are produced. Specifically, cost per unit is $21 when 100,000 units are produced versus $25 per unit at 60,000 units. The reason for this difference is because the company is spreading the $600,000 fixed overhead cost over more units when 100,000 units are produced than when 60,000 are produced.

The difference in cost per unit impacts performance reporting. Exhibit 6.10 presents the income statement under absorption costing for the two alternative production levels.

EXHIBIT 6.10

Income Under Absorption Costing for Different Production Levels

ICEAGE COMPANY Income Statement (Absorption Costing) For Year Ended December 31, 2007 [60,000 Units Produced; 60,000 Units Sold]		
Sales (60,000 × $40)		$2,400,000
Cost of goods sold (60,000 × $25)		1,500,000
Gross margin		900,000
Selling and administrative expenses		
Variable (60,000 × $2)	$120,000	
Fixed	200,000	320,000
Net income		$ 580,000

ICEAGE COMPANY Income Statement (Absorption Costing) For Year Ended December 31, 2007 [100,000 Units Produced; 60,000 Units Sold]		
Sales (60,000 × $40)		$2,400,000
Cost of goods sold (60,000 × $21)		1,260,000
Gross margin		1,140,000
Selling and administrative expenses		
Variable (60,000 × $2)	$120,000	
Fixed	200,000	320,000
Net income		$ 820,000

Point: The 41% income increase is computed as:

$$\frac{\$820{,}000 - \$580{,}000}{\$580{,}000} = 0.41$$

Common sense suggests that because the company's variable cost per unit, total fixed costs, and sales are identical in both cases, merely producing more units and creating excess ending inventory should not increase income. Yet, as we see in Exhibit 6.10, income under absorption costing is 41% greater if management produces 40,000 more units than necessary and builds up ending inventory. The reason is that $240,000 of fixed overhead (40,000 units × $6) is assigned to ending inventory instead of being expensed as cost of goods sold in 2007. This shows that a manager can report increased income merely by producing more and disregarding whether the excess units can be sold or not.

Manager bonuses are tied to income computed under absorption costing for many companies. Accordingly, these managers may be enticed to increase production that increases income and their bonuses. This incentive problem encourages inventory buildup, which leads to increased costs in storage, financing, and obsolescence. If the excess inventory is never sold, it will be disposed of at a loss.

The manager incentive problem can be avoided when income is measured using variable costing. To illustrate, Exhibit 6.11 reports income under variable costing for the same production levels used in Exhibit 6.10. This demonstrates that managers cannot increase income under variable costing by merely increasing production without increasing sales.

Why is income under absorption costing affected by the production level when that for variable costing is not? The answer lies in the different treatment of fixed overhead costs for the two methods. Under absorption costing, fixed overhead *per unit* is lower when 100,000 units are produced than when 60,000 units are produced, and then fixed overhead cost is allocated to more units—recall Exhibit 6.9. If those excess units produced are not sold, the fixed overhead cost allocated to those units is not expensed until a future period when those units are sold.

ICEAGE COMPANY
Income Statement (Variable Costing)
For Year Ended December 31, 2007
[60,000 Units Produced; 60,000 Units Sold]

Sales (60,000 × $40)		$2,400,000
Variable expenses		
Variable production costs (60,000 × $15)	$900,000	
Variable selling and administrative expenses (60,000 × $2)	120,000	1,020,000
Contribution margin		1,380,000
Fixed expenses		
Fixed overhead	600,000	
Fixed selling and administrative expense	200,000	800,000
Net income		$ 580,000

ICEAGE COMPANY
Income Statement (Variable Costing)
For Year Ended December 31, 2007
[100,000 Units Produced; 60,000 Units Sold]

Sales (60,000 × $40)		$2,400,000
Variable expenses		
Variable production costs (60,000 × $15)	$900,000	
Variable selling and administrative expenses (60,000 × $2)	120,000	1,020,000
Contribution margin		1,380,000
Fixed expenses		
Fixed overhead	600,000	
Fixed selling and administrative expense	200,000	800,000
Net income		$ 580,000

EXHIBIT 6.11
Income Under Variable Costing for Different Production Levels

Reported income under variable costing, on the other hand, is not affected by production level changes because *all* fixed production costs are expensed in the year when incurred. Under variable costing, companies increase reported income by selling more units—it is not possible to increase income just by producing more units and creating excess inventory.

Point: A per unit cost that is constant at all production levels is a *variable cost per unit.*

Decision Ethics

Production Manager Your company produces and sells MP3 players. Due to competition, your company projects sales to be 35% less than last year. In a recent meeting, the CEO expressed concern that top executives may not receive bonuses because of the expected sales decrease. The controller suggests that if the company continues to produce as many units as last year, reported income might achieve the level for bonuses to be paid. Should your company produce excess inventory to maintain income? What ethical issues arise? [Answer—p. 221]

Setting Prices

C3 Explain the role of variable costing in pricing special orders.

Setting prices for products and services is one of the more complex and important managerial decisions. Although many factors impact pricing, cost is a crucial factor. Cost information from both absorption costing and variable costing can aid managers in pricing.

Over the long run, price must be high enough to cover all costs, including variable costs and fixed costs, and still provide an acceptable return to owners. For this purpose, absorption cost information is useful because it reflects the full costs that sales must exceed for the company to be profitable.

Over the short run, however, fixed production costs such as the cost to maintain plant capacity does not change with changes in production levels. With excess capacity, increases in production level would increase variable production costs, but not fixed costs. This implies that while managers try to maintain the long-run price on existing orders, which covers all production costs, managers should accept special orders *provided the special order price exceeds variable cost*.

To illustrate, let's return to the data of IceAge Company. Recall that its variable production cost per unit is $15 and its total production cost per unit is $25 (at production level of 60,000 units). Assume that it receives a special order for 1,000 pairs of skates at an offer price of $22 per pair from a foreign skating school. This special order will not affect IceAge's regular sales and its plant has excess capacity to fill the order.

Drawing on absorption costing information, we observe that cost is $25 per unit and that the special order price is $22 per unit. These data would suggest that management reject the order as it would lose $3,000, computed as 1,000 units at $3 loss per pair ($22 − $25).

Point: Use of relevant costs in special order and other managerial decisions is covered more extensively in a later chapter.

However, closer analysis suggests that this order should be accepted. This is because the $22 order price exceeds the $15 variable cost of the product. Specifically, Exhibit 6.12 reveals that the incremental revenue from accepting the order is $22,000 (1,000 units at $22 per unit), whereas the incremental production cost of the order is $15,000 (1,000 units at $15 per unit) and the incremental variable selling and administrative cost is $2,000 (1,000 units at $2 per unit). Thus, both its contribution margin and net income would increase by $5,000 from accepting the order. We see that variable costing reveals this opportunity while absorption costing obscures it.

EXHIBIT 6.12

Computing Incremental Income for a Special Order

Rejecting Special Order		Accepting Special Order	
Incremental sales	$ 0	Incremental sales (1,000 × $22)	$22,000
Incremental costs	0	Incremental costs	
		Variable production cost (1,000 × $15)	15,000
		Variable selling and admin. expense (1,000 × $2)	2,000
Incremental income	$ 0	Incremental income	$ 5,000

Point: Fixed overhead costs won't increase when these additional units are sold because the company already has the capacity.

The reason for increased income from accepting the special order lies in the different behavior of variable and fixed production costs. We see that if the order is rejected, only variable costs are saved. Fixed costs, on the other hand, do not change in the short run regardless of rejecting or accepting this order. Since incremental revenue from the order exceeds incremental costs (only variable cost in this case), accepting the special order increases company income.

Decision Insight

Costing for Services Most of this chapter's illustrations use data from a manufacturer. Yet, variable costing also applies to service companies. A "special order" example is pricing for airlines when they sell tickets a day or so before a flight at deeply discounted prices. Provided the discounted price exceeds variable costs, such sales increase contribution margin and net income.

Controlling Costs

Every company strives to control costs to be competitive. An effective cost control practice is to hold managers responsible only for their **controllable costs.** A cost is controllable if a manager has the power to determine or at least markedly affect the amount incurred. **Uncontrollable costs** are not within the manager's control or influence. For example, direct materials cost is controllable by a production supervisor. On the other hand, costs related to production capacity are not controllable by that supervisor as that supervisor does not have authority to change factory size or add new machinery. Generally, variable production costs and fixed production costs are controlled at different levels of management. Similarly, variable selling and administrative costs are usually controlled at a level of management different from that which controls fixed selling and administrative costs.

Under absorption costing, both variable production costs and fixed production costs are included in product cost. This makes it difficult to evaluate the effectiveness of cost control by different levels of managers. Variable costing separates the variable costs from fixed costs and, therefore, makes it easier to identify and assign control over costs.

Decisions to change a company's fixed costs are usually assigned to higher-level managers. This is different from most variable costs that are assigned to lower-level managers and supervisors. When we separately report variable and fixed cost elements, as is done with an income statement in the **contribution format,** it highlights the impact of each cost element for income. This makes it easier for us to identify problem areas and to take cost control measures by appropriate levels of management. This approach is also useful in evaluating the performance of managers of different segments within a company.

Decision Maker

Internal Auditor Your company uses absorption costing for preparing its GAAP-based income statement and balance sheet. Management is disappointed because its external auditors are requiring it to write off an inventory amount because it exceeds what the company could reasonably sell in the foreseeable future. Why would management produce more than it sells? Why would management be disappointed about the write-off? [Answer—p. 221]

Limitations of Reports Using Variable Costing

An important generally accepted accounting principle is that of matching. Most managers interpret the matching principle as expensing all manufacturing costs, both variable and fixed, in the period when the related product is sold rather than when incurred. Consequently, absorption costing is almost exclusively used for external reporting. For income tax purposes, absorption costing is the only acceptable basis for filings with the Internal Revenue Service (IRS) under the Tax Reform Act of 1986.

Thus, and despite the many useful applications and insights provided by variable cost reports, *absorption costing is the only acceptable basis for both external reporting and tax reporting*. Also, as we discussed, top executives are often awarded bonuses based on income computed using absorption costing. These realities contribute to the widespread use of absorption costing by companies.

Quick Check

Answers—p. 221

5. Why is information under variable costing useful in making short-run pricing decisions when idle capacity exits?
6. Discuss the usefulness of absorption costing versus variable costing in controlling costs.
7. What are the limitations of variable costing?

Break-Even Analysis

Decision Analysis

A2 Compute and interpret break-even volume in units.

The previous chapter discussed cost-volume-profit (CVP) analysis for making managerial decisions. However, if the income statement is prepared under absorption costing, the data needed for CVP analysis are not readily available. Accordingly, substantial effort is required to go back to the accounting records and reclassify the cost data to obtain information necessary for conducting CVP analysis.

On the other hand, if the income statement is prepared using the contribution format, the data needed for CVP analysis are readily available. To illustrate, we can draw on IceAge's contribution margin income statement from Exhibit 6.4 (reproduced below) to readily compute its contribution margin per unit and its break-even volume in units.

ICEAGE COMPANY
Income Statement (Variable Costing)
For Year Ended December 31, 2007

	Dollars		Per Unit	
Sales (60,000 × $40)		$2,400,000		$40
Variable expenses				
Variable production costs (60,000 × $15)	$900,000		$15	
Variable selling and administrative expenses (60,000 × $2)	120,000	1,020,000	2	17
Contribution margin		1,380,000		$23
Fixed expenses				
Fixed overhead	600,000			
Fixed selling and administrative expense	200,000	800,000		
Net income		$ 580,000		

We compute and report the company's contribution margin per unit and its components in the far right columns of the exhibit above. Recall that contribution margin per unit is defined as follows.

$$\begin{aligned}\text{Contribution margin per unit} &= \text{Sales price per unit} - \text{Variable cost per unit} \\ &= \$40 - \$17 = \$23\end{aligned}$$

The above report shows that its variable cost per unit consists of $15 in variable production costs and $2 in variable selling and administrative costs.

We also see that the company's total fixed costs of $800,000 is the sum of $600,000 in fixed overhead cost and $200,000 in fixed selling and administrative cost. From this information we can compute the company's break-even volume in units as follows.

$$\text{Break-even volume in units} = \frac{\text{Total fixed costs}}{\text{Contribution margin per unit}} = \frac{\$800{,}000}{\$23} = 34{,}783 \text{ units}$$

This finding implies that the company must produce and sell 34,783 units to break-even (zero income). Sales less than that amount would yield a net loss and sales above that amount would yield net income.

Demonstration Problem

Navaroli Company began operations on January 5, 2008. Cost and sales information for its first two calendar years of operations are summarized below.

Manufacturing costs	
Direct materials	$80 per unit
Direct labor	$120 per unit
Factory overhead costs for the year	
Variable overhead	$30 per unit
Fixed overhead	$14,000,000
Nonmanufacturing costs	
Variable selling and administrative	$10 per unit
Fixed selling and administrative	$ 8,000,000
Production and sales data	
Units produced, 2008	200,000 units
Units sold, 2008	140,000 units
Units in ending inventory, 2008	60,000 units
Units produced, 2009	80,000 units
Units sold, 2009	140,000 units
Units in ending inventory, 2009	0 units
Sales price per unit	$600 per unit

Required

1. Prepare an income statement for the company for 2008 under absorption costing.
2. Prepare an income statement for the company for 2008 under variable costing.
3. Explain the source(s) of the difference in reported income for 2008 under the two costing methods.
4. Prepare an income statement for the company for 2009 under absorption costing.
5. Prepare an income statement for the company for 2009 under variable costing.
6. Prepare a schedule to convert variable costing income to absorption costing income for the years 2008 and 2009. Use the format in Exhibit 6.8.

Planning the Solution

- Set up a table to compute the unit cost under the two costing methods (refer to Exhibit 6.2).
- Prepare an income statement under both of the two costing methods (refer to Exhibit 6.5).
- Consider differences in the treatment of fixed production costs for the income statement to answer requirements 3 and 6.

Solution to Demonstration Problem

Before the income statement for 2008 is prepared, unit costs for 2008 are computed under the two costing methods as follows.

	Absorption Costing	Variable Costing
Direct materials per unit	$ 80	$ 80
Direct labor per unit	120	120
Overhead per unit		
Variable overhead per unit	30	30
Fixed overhead per unit*	70	—
Total production cost per unit	$300	$230

* Fixed overhead per unit = $14,000,000 ÷ 200,000 units = $70 per unit.

1. Absorption costing income statement for 2008.

NAVAROLI COMPANY
Income Statement
For Year Ended December 31, 2008

Sales (140,000 × $600)	$84,000,000
Cost of goods sold (140,000 × $300)	42,000,000
Gross margin	42,000,000
Selling and administrative expenses ($1,400,000 + $8,000,000)	9,400,000
Net income	$32,600,000

2. Variable costing income statement for 2008.

NAVAROLI COMPANY
Income Statement (Contribution Format)
For Year Ended December 31, 2008

Sales (140,000 × $600)		$84,000,000
Variable expenses		
Variable production costs (140,000 × $230)	$32,200,000	
Variable selling and administrative costs	1,400,000	33,600,000
Contribution margin		50,400,000
Fixed expenses		
Fixed overhead	14,000,000	
Fixed selling and administrative	8,000,000	22,000,000
Net income		$28,400,000

3. Income under absorption costing is $4,200,000 more than that under variable costing even though sales are identical for each. This difference is due to the different treatment of fixed overhead cost. Under variable costing, the entire $14,000,000 of fixed overhead is expensed on the 2008 income statement. However, under absorption costing, $70 of fixed overhead cost is allocated to each of the 200,000 units produced. Since there were 60,000 units unsold at year-end, $4,200,000 (60,000 units × $70 per unit) of fixed overhead cost allocated to these units will be carried on its balance sheet in ending inventory. Consequently, reported income under absorption costing is $4,200,000 higher than variable costing income for the current period.

Before the income statement for 2009 is prepared, unit costs are computed under the two costing methods as follows.

	Absorption Costing	Variable Costing
Direct materials per unit	$ 80	$ 80
Direct labor per unit	120	120
Overhead per unit		
Variable overhead per unit	30	30
Fixed overhead per unit*	175	
Total production cost per unit	$405	$230

* Fixed overhead per unit = $14,000,000/80,000 units = $175 per unit.

4. Absorption costing income statement for 2009.

NAVAROLI COMPANY Income Statement For Year Ended December 31, 2009		
Sales (140,000 × $600)		$84,000,000
Cost of goods sold		
From beginning inventory (60,000 × $300)	$18,000,000	
Produced during the year (80,000 × $405)	32,400,000	50,400,000
Gross margin		33,600,000
Selling and administrative expenses ($1,400,000 + $8,000,000)		9,400,000
Net income		$24,200,000

5. Variable costing income statement for 2009.

NAVAROLI COMPANY Income Statement (Contribution Format) For Year Ended December 31, 2009		
Sales (140,000 × $600)		$84,000,000
Variable expenses		
Variable production costs (140,000 × $230)	$32,200,000	
Variable selling and administrative costs	1,400,000	33,600,000
Contribution margin		50,400,000
Fixed expenses		
Fixed overhead	14,000,000	
Fixed selling and administrative	8,000,000	22,000,000
Net income		$28,400,000

6. Conversion of variable costing income to absorption costing income.

	2008	2009
Variable costing income	$28,400,000	$28,400,000
Add: Fixed overhead cost deferred in ending inventory (60,000 × $70)	4,200,000	0
Less: Fixed overhead cost recognized from beginning inventory (60,000 × $70)	0	(4,200,000)
Absorption costing income	$32,600,000	$24,200,000

Summary

C1 Distinguish between absorption costing and variable costing. Product cost consists of direct materials, direct labor, and overhead. Absorption costing and variable costing methods differ on what overhead costs are allocated to products. Under absorption costing, all overhead costs, both fixed and variable, are allocated to products. Under variable costing, only variable overhead costs are allocated to products; the fixed overhead costs are treated as a period cost and are charged as an expense in the period when incurred.

C2 Describe how absorption costing can result in overproduction. Under absorption costing, fixed overhead costs are allocated to all units including both units sold and units in ending inventory. Consequently, expenses associated with the fixed overhead allocated to ending inventory are deferred to a future period. As a result, the larger ending inventory is, the more overhead cost is deferred to the future, and the greater current period income is.

C3 Explain the role of variable costing in pricing special orders. Over the short run, fixed production costs such as cost of maintaining plant capacity do not change with changes in production levels. When there is excess capacity, increases in production levels would only increase variable costs. Thus, managers should accept special orders as long as the order price is greater than the variable cost. This is because accepting the special order would increase only variable costs.

A1 Analyze income reporting for both absorption and variable costing. Under absorption costing, some fixed overhead cost is allocated to ending inventory and is carried on the balance sheet to the next period. However, all fixed costs are expensed in the period incurred under variable costing. Consequently, absorption costing income is generally greater than variable costing income if units produced exceed units sold, and conversely.

A2 Compute and interpret break-even volume in units. Breakeven volume in units is defined as total fixed costs divided by contribution margin per unit. The result gives managers a unit goal to achieve breakeven; if the goal is surpassed, the company earns income.

P1 Compute unit cost under both absorption and variable costing. Absorption cost per unit includes direct materials, direct labor, and *all* overhead, whereas variable cost per unit includes direct materials, direct labor, and only *variable* overhead.

P2 Prepare an income statement using absorption costing and using variable costing. The variable costing income statement differs from the absorption costing income statement in that it classifies expenses based on cost behavior rather than function. Instead of gross margin, the variable costing income statement shows contribution margin. This contribution margin format focuses attention on the relation between costs and sales that is not evident from the absorption costing format.

P3 Prepare a contribution margin report. Under variable costing, the total variable costs are first deducted from sales to arrive at contribution margin. Variable costs and contribution margin are also shown as ratios (after dividing by dollar sales).

P4 Convert income under variable costing to the absorption cost basis. Variable costing income can be adjusted to absorption costing income by adding the fixed cost allocated to ending inventory and subtracting the fixed cost previously allocated to beginning inventory.

Guidance Answers to Decision Maker and Decision Ethics

Production Manager Under absorption costing, fixed production costs are spread over all units produced. Thus, fixed cost for each unit would be lower if more units are produced because the fixed cost is spread over more units. This means the company can increase income by producing excess units even if sales remain constant. With sales lagging, producing excess inventory leads to increased financing cost and inventory obsolescence. Also, producing excess inventory to meet income levels for bonuses harms company owners and is unethical. You must discuss this with the appropriate managers.

Internal Auditor If manager bonuses are tied to income, they would have incentives to increase income for personal gain. If absorption costing is used to determine income, management can reduce current period expenses (and raise income) with over-production, which shifts fixed production costs to future periods. This decision fails to consider whether there is a viable market for all units that are produced. If there is not, an auditor can conclude that the inventory does not have "future economic value" and pressure management to write it off. Such a write-off reduces income by the cost of the excess inventory.

Guidance Answers to Quick Checks

1. a, b, c, and d; Direct materials, direct labor, variable overhead, and fixed overhead.
2. a, b, and c; Direct materials, direct labor, and variable overhead.
3. c; see Exhibit 6.5
4. a; see Exhibit 6.6
5. This is because only the variable cost will be avoided if a special order is rejected, as fixed cost does not change with changes to short-run sales. This means a company is better off taking an order provided the order price exceeds variable cost.
6. Variable costs and fixed costs are typically influenced by decisions at different managerial levels. Since reports under variable costing separate variable costs from fixed costs, variable costing makes it easier to identify and control these cost elements.
7. Variable costing is not accepted for external reporting and income tax purposes—only absorption costing is acceptable for those purposes.

Key Terms mhhe.com/wildMA2e

Key Terms are available at the book's Website for learning and testing in an online Flashcard Format.

Absorption costing (also called full costing) (p. 206)
Contribution format (p. 216)
Contribution margin income statement (p. 209)
Contribution margin report (p. 209)
Controllable costs (p. 216)
Fixed overhead cost deferred in inventory (p. 213)
Fixed overhead cost recognized from inventory (p. 213)
Uncontrollable costs (p. 216)
Variable costing (also called direct or marginal costing) (p. 206)

Multiple Choice Quiz Answers on p. 235 mhhe.com/wildMA2e

Additional Quiz Questions are available at the book's Website.

Answer questions 1 and 2 using the following company data.

Units produced	1,000
Variable costs	
Direct materials	$3 per unit
Direct labor	$5 per unit
Variable overhead	$3 per unit
Variable selling and administrative	$1 per unit
Fixed overhead	$3,000
Fixed selling and administrative	$1,000

1. Product cost per unit under absorption costing is:
   a. $11
   b. $12
   c. $14
   d. $15
   e. $16
2. Product cost per unit under variable costing is:
   a. $11
   b. $12
   c. $14
   d. $15
   e. $16
3. Under variable costing, which costs are included in product cost?
   a. All variable product costs, including direct materials, direct labor, and variable overhead.
   b. All variable and fixed allocations of product costs, including direct materials, direct labor, and both variable and fixed overhead.
   c. All variable product costs except for variable overhead.
   d. All variable and fixed allocations of product costs, except for both variable and fixed overhead.
4. The difference between unit product cost under absorption costing as compared to that under variable costing is:
   a. Direct materials and direct labor.
   b. Fixed and variable portions of overhead.
   c. Fixed overhead only.
   d. Variable overhead only.
5. When production exceeds sales, which of the following is true?
   a. No change occurs to inventories for either absorption costing or variable costing methods.
   b. Use of absorption costing produces a higher net income than the use of variable costing.
   c. Use of absorption costing produces a lower net income than the use of variable costing.
   d. Use of absorption costing causes inventory value to decrease more than it would through the use of variable costing.

Discussion Questions

1. What costs are normally included as part of product costs under the method of absorption costing?
2. What costs are normally included as part of product costs under the method of variable costing?
3. Describe how the following items are computed: *a.* Gross margin, and *b.* Contribution margin
4. When units produced exceed units sold for a reporting period, would income under variable costing be greater than, equal to, or less than income under absorption costing? Explain.
5. Describe how use of absorption costing in determining income can lead to over-production and a buildup of inventory. Explain how variable costing can avoid this same problem.
6. How can absorption costing lead to incorrect short-run pricing decisions?
7. What conditions must exist to achieve accurate short-run pricing decisions using variable costing?
8. Describe the usefulness of variable costing for controlling company costs.
9. Explain how contribution margin analysis is useful for managerial decisions and performance evaluations.
10. What are the major limitations of variable costing?
11. How can variable costing income statements be converted to absorption costing?

12. How can variable costing reports prepared using the contribution margin format help managers in computing break-even volume in units?

13. How can **Best Buy** use variable costing to help better understand its operations and to make better pricing decisions?

14. Assume that **Apple** has received a special order from a retailer for 1,000 specially outfitted iMacs. This is a one-time order, which will not require any additional capacity or fixed costs. What should Apple consider when determining a selling price for these iMacs?

Denotes Discussion Questions that involve decision making.

connect *Most materials in this section are available in McGraw-Hill's Connect*

QUICK STUDY

QS 6-1
Computing unit cost under absorption costing
C1 P1

Jordyn Company reports the following information regarding its production costs. Compute its production cost per unit under absorption costing.

Direct materials	$20 per unit
Direct labor	$30 per unit
Overhead costs for the year	
Variable overhead	$ 10 per unit
Fixed overhead	$160,000
Units produced	20,000 units

QS 6-2
Computing unit cost under variable costing C1 P1

Refer to Jordyn Company's data in QS 6-1. Compute its production cost per unit under variable costing.

QS 6-3
Computing manufacturing margin P2

Leila Company sold 10,000 units of its product at a price of $80 per unit. Total variable cost is $50 per unit, consisting of $40 in variable production cost and $10 in variable selling and administrative cost. Compute the manufacturing (production) margin for the company under variable costing.

QS 6-4
Computing contribution margin
P3

Refer to the information for Leila Company in QS 6-3. Compute the contribution margin for this company.

QS 6-5
Production level, absorption costing, and gross margin
P3 A1

Martol Company reports the following cost data for its single product. The company regularly sells 20,000 units of its product at a price of $80 per unit. If Martol doubles its production to 40,000 units while sales remain at the current 20,000 unit level, by how much would the company's gross margin increase or decrease under absorption costing?

Direct materials	$10 per unit
Direct labor	$12 per unit
Overhead costs for the year	
Variable overhead	$3 per unit
Fixed overhead per year	$40,000
Normal production level (in units)	20,000 units

QS 6-6
Production level, variable costing, gross margin P2 P3

Refer to the information about Martol Company in QS 6-5. Would the answer to the question in QS 6-5 change if the company uses variable costing? Explain.

QS 6-7
Break-even volume in units
A2

Lor Company's single product sells at a price of $108 per unit. Cost data for its single product follows. Compute this company's break-even volume in units.

Direct materials	$20 per unit
Direct labor	$28 per unit
Overhead costs	
Variable overhead	$ 6 per unit
Fixed overhead per year	$80,000 per year
Selling and administrative expenses	
Variable	$ 18 per unit
Fixed	$100,000 per year

QS 6-8
Special order pricing
C3

Sheyla Company produces a product that sells for $84 per unit. A customer contacts Sheyla and offers to purchase 2,000 units of its product at a price of $76 per unit. Variable production costs with this order would be $30 per unit, and variable selling expenses would be $18 per unit. Assuming that this special order would not require any additional fixed costs, and that Sheyla has sufficient capacity to produce the product without affecting regular sales, explain to Sheyla's management why it might be a good decision to accept this special order.

QS 6-9
Converting variable costing income to absorption costing
P4

Aivars Company reports the following variable costing income statement for its single product. This company's sales totaled 50,000 units, but its production was 80,000 units. It had no beginning finished goods inventory for the current period.

AIVARS COMPANY
Income Statement (Variable Costing)

Sales (50,000 units × $60 per unit)	$3,000,000
Variable expenses	
Variable manufacturing expense (50,000 units × $28 per unit)	1,400,000
Variable selling and admin. expense (50,000 units × $5 per unit)	250,000
Total variable expenses	1,650,000
Contribution margin	1,350,000
Fixed expenses	
Fixed overhead	320,000
Fixed selling and administrative expense	160,000
Total fixed expenses	480,000
Net income	$ 870,000

1. Convert this company's variable costing income statement to an absorption costing income statement.
2. Explain the difference in income between the variable costing and absorption costing income statement.

Most materials in this section are available in McGraw-Hill's Connect connect

EXERCISES

Exercise 6-1
Computing unit and inventory costs under absorption costing and variable costing
P1

Duo Company reports the following information for the current year, which is its first year of operations.

Direct materials	$15 per unit
Direct labor	$16 per unit
Overhead costs for the year	
Variable overhead	$ 80,000 per year
Fixed overhead	$160,000 per year
Units produced this year	20,000 units
Units sold this year	14,000 units
Ending finished goods inventory in units	6,000 units

1. Compute the cost per unit of finished goods using absorption costing.
2. Compute the cost per unit of finished goods using variable costing.
3. Determine the cost of ending finished goods inventory using absorption costing.
4. Determine the cost of ending finished goods inventory using variable costing.

Check (1) Absorption cost per unit, $43; (2) Variable cost per unit, $35

Exercise 6-2

Income reporting under absorption costing and variable costing

P2 A1

Adams Company, a manufacturer of in-home decorative fountains, began operations on September 1 of the current year. Its cost and sales information for this year follows.

Production costs	
Direct materials	$40 per unit
Direct labor	$60 per unit
Overhead costs for the year	
Variable overhead	$3,000,000
Fixed overhead	$7,000,000
Nonproduction costs for the year	
Variable selling and administrative	$ 770,000
Fixed selling and administrative	$4,250,000
Production and sales for the year	
Units produced	100,000 units
Units sold	70,000 units
Sales price per unit	$350 per unit

1. Prepare an income statement for the company using absorption costing.
2. Prepare an income statement for the company using variable costing.
3. Under what circumstance(s) is reported income identical under both absorption costing and variable costing?

Check (1) Absorption costing income, $5,480,000; (2) Variable costing income, $3,380,000

Exercise 6-3

Income reporting under absorption costing and variable costing

P2 A1

Norwood Company, a producer of solid oak tables, reports the following data from its current year operations, which is its second year of business.

Sales price per unit	$320 per unit
Units produced this year	115,000 units
Units sold this year	118,000 units
Units in beginning-year inventory	3,000 units
Beginning inventory costs	
Variable (3,000 units × $135)	$405,000
Fixed (3,000 units × $80)	240,000
Total	$645,000
Production costs this year	
Direct materials	$40 per unit
Direct labor	$62 per unit
Overhead costs this year	
Variable overhead	$3,220,000
Fixed overhead	$7,400,000
Nonproduction costs this year	
Variable selling and administrative	$1,416,000
Fixed selling and administrative	4,600,000

1. Prepare the current year income statement for the company using absorption costing.
2. Prepare the current year income statement for the company using variable costing.
3. Explain any difference between the two income numbers under the two costing methods in parts 1 and 2.

Check (1) Absorption costing income, $8,749,000; (2) Variable costing income, $8,989,000

Exercise 6-4

Converting absorption costing income to variable costing income

P2 P4

Kenai Kayaking, a manufacturer of kayaks, began operations this year. During this first year, the company produced 1,050 kayaks and sold 800. At the current year-end, the company reported the following income statement information using absorption costing.

Sales (800 × $1,050)	$840,000
Cost of goods sold (800 × $500)	400,000
Gross margin	440,000
Selling and administrative expenses	230,000
Net income	$210,000

Additional Information

a. Production cost per kayak totals $500, which consists of $400 in variable production cost and $100 in fixed production cost—the latter amount is based on $105,000 of fixed production costs allocated to the 1,050 kayaks produced.

b. The $230,000 in selling and administrative expense consists of $75,000 that is variable and $155,000 that is fixed.

Check (1) Variable costing income, $185,000

1. Prepare an income statement for the current year of Kenai Kayaking under variable costing.

2. Explain the difference in income between the variable costing and absorption costing income statement.

Exercise 6-5

Converting variable costing income to absorption costing income

P2 P4

Lyon Furnaces prepares the income statement under variable costing for its managerial reports, and it prepares the income statement under absorption costing for external reporting. For its first month of operations, this company prepares the following income statement information under variable costing.

Sales (225 × $1,600)	$360,000
Variable production cost (225 × $625)	140,625
Variable selling and administrative expenses (225 × $65)	14,625
Contribution margin	204,750
Fixed overhead cost	56,250
Fixed selling and administrative expense	75,000
Net income	$ 73,500

Additional Information

During this first month of operations, 375 furnaces were produced and 225 were sold; this left 150 furnaces in ending inventory.

Check (1) Absorption costing income, $96,000

1. Prepare this company's income statement for its first month of operations under absorption costing.

2. Explain the difference in income between the variable costing and absorption costing income statement.

Exercise 6-6

Unit costs and income statement under absorption costing and variable costing

P1 P2 P4

Blue Sky Company reports the following costing data on its product for its first year of operations. During this first year, the company produced 44,000 units and sold 36,000 units at a price of $140 per unit.

Production costs	
Direct materials per unit	$60
Direct labor per unit	$22
Variable overhead per unit	$8
Fixed overhead for the year	$528,000
Selling and administrative cost	
Variable selling and administrative cost per unit	$11
Fixed selling and administrative cost per year	$105,000

1. Assume that this company uses absorption costing.

Check (1a) Absorption cost per unit, $102

a. Determine its unit product cost.

b. Prepare its income statement for the year under absorption costing.

2. Assume that this company uses variable costing.

(2a) Variable cost per unit, $90

a. Determine its unit product cost.

b. Prepare its income statement for the year under variable costing.

Exercise 6-7
Variable costing for services
C3

Midsouth Airlines provides charter airplane services. In October this year, the company was operating at 60% of its capacity when it received a bid from the local community college. The college was organizing a Washington, D.C., trip for its international student group. The college only budgeted $30,000 for roundtrip airfare. Midsouth Airlines normally charges between $50,000 and $60,000 for such service given the number of travelers. Midsouth determined its cost for the roundtrip flight to Washington to be $44,000, which consists of the following:

Variable cost	$15,000
Fixed cost	29,000
Total cost	$44,000

Although the manager at Midsouth supports the college's educational efforts, she could not justify accepting the $30,000 bid for the trip given the projected $14,000 loss. Still, she decides to consult with you, an independent financial consultant. Do you believe the airline should accept the bid from the college? Prepare a memorandum, with supporting computations, explaining why or why not.

Exercise 6-8
Variable costing and contribution margin income statement
P3 A1

Down Jackets has three types of costs: jacket cost, factory rent cost, and utilities cost. This company sells its jackets for $16.50 each. Management has prepared the following estimated cost information for next month under two different sales levels.

	At 10,000 Jackets	At 12,000 Jackets
Jacket cost	$80,000	$96,000
Rent cost	6,000	6,000
Utilities cost	8,400	9,900

Required

1. Compute what the company should expect for total variable cost if 11,000 jackets are sold next month. (*Hint:* Use the high-low method to separate jacket and utilities costs into their variable and fixed components.)
2. Prepare its contribution format income statement for a monthly sales volume of 12,000 jackets.

Check (2) Income, $86,100

Exercise 6-9
Contribution margin format income statement
P3 A1

Polarix is a retailer of ATVs (all terrain vehicles) and accessories. An income statement for its Consumer ATV Department for the current year follows. ATVs sell, on average, for $3,800. Variable selling expenses are $270 each. The remaining selling expenses are fixed. Administrative expenses are 40% variable and 60% fixed. The company does not manufacture its own ATVs; it purchases them from a supplier for $1,830 each.

POLARIX
Income Statement—Consumer ATV Department
For Year Ended December 21, 2009

Sales		$646,000
Cost of goods sold		311,100
Gross margin		334,900
Operating expenses		
Selling expenses	$135,000	
Administrative expenses	59,500	194,500
Net income		$140,400

Required

1. Prepare an income statement for this current year using the contribution margin format.
2. For each ATV sold during this year, what is the contribution toward covering fixed expenses and that toward earning income?

Check (2) $1,560

Most materials in this section are available in McGraw-Hill's Connect connect

PROBLEM SET A

Problem 6-1A

Converting an absorption costing income statement to a variable costing income statement

P1 P2 P4 A1

Torres Company began operations this year. During this first year, the company produced 100,000 units and sold 80,000 units. The absorption costing income statement for its first year of operations follows.

Sales (80,000 units × $50 per unit)		$4,000,000
Cost of goods sold		
Beginning inventory	$ 0	
Cost of goods manufactured (100,000 units × $30 per unit)	3,000,000	
Cost of good available for sale	3,000,000	
Ending inventory (20,000 × $30)	600,000	
Cost of goods sold		2,400,000
Gross margin		1,600,000
Selling and administrative expenses		530,000
Net income		$1,070,000

Additional Information

a. Selling and administrative expenses consist of $350,000 in annual fixed expenses and $2.25 per unit in variable selling and administrative expenses.

b. The company's product cost of $30 per unit is computed as follows.

Direct materials	$5 per unit
Direct labor	$14 per unit
Variable overhead	$2 per unit
Fixed overhead ($900,000/100,000 units)	$9 per unit

Required

Check (1) Variable costing income, $890,000

1. Prepare an income statement for the company under variable costing.

2. Explain any difference between the income under variable costing (from part 1) and the income reported above.

Problem 6-2A

Converting an absorption costing income statement to a variable costing income statement (two consecutive years)

P2 P4 A1

Powell Company produces a single product. Its income statement under absorption costing for its first two years of operation follow.

	2008	2009
Sales ($46 per unit)	$920,000	$1,840,000
Cost of goods sold ($31 per unit)	620,000	1,240,000
Gross margin	300,000	600,000
Selling and administrative expenses	290,000	340,000
Net income	$ 10,000	$ 260,000

Additional Information

a. Sales and production data for these first two years follow.

	2008	2009
Units produced	30,000	30,000
Units sold	20,000	40,000

b. Variable cost per unit and total fixed costs are unchanged during 2008 and 2009. The company's $31 per unit product cost consists of the following.

Direct materials	$ 5
Direct labor	9
Variable overhead	7
Fixed overhead ($300,000/30,000 units)	10
Total product cost per unit	$31

c. Selling and administrative expenses consist of the following.

	2008	2009
Variable selling and administrative ($2.5 per unit)	$ 50,000	$100,000
Fixed selling and administrative	240,000	240,000
Total selling and administrative	$290,000	$340,000

Required

1. Prepare income statements for the company for each of its first two years under variable costing.
2. Explain any difference between the absorption costing income and the variable costing income for these two years.

Check (1) 2008 net loss, $(90,000)

Problem 6-3A

CVP analysis, absorption costing, and variable costing

A1 A2

Refer to information about Powell Company in Problem 6-2A. In the company's planning documents, Kyra Powell, the company's president, reports that the break-even volume (in units) for the company is 21,739 units. This break-even point is computed as follows.

$$\text{Break-even volume} = \frac{\text{Total fixed cost}}{\text{Contribution margin per unit}} = \frac{\$540{,}000}{\$22.50} = 24{,}000 \text{ units}$$

Total fixed cost consists of $300,000 in fixed production cost and $240,000 in fixed selling and administrative expenses. The contribution margin per unit of $22.50 is computed by deducting the $23.50 variable cost per unit (which consists of $21 in variable production cost and $2.50 in variable selling and administrative cost) from the $46 sales price per unit. In 2008, the company sold 20,000 units, which was below break-even, and Kyra was concerned that the company's income statement would show a net loss. To her surprise, the company's 2008 income statement revealed a net income of $10,000 as shown in Problem 6-2A.

Required

Prepare a one-half-page memorandum to the president explaining how the company could report net income when it sold less than its break-even volume in units.

Problem 6-4A

Variable cost analysis for a services company

C3

Winter Garden is a luxury hotel with 150 suites. Its regular suite rate is $250 per night per suite. The hotel's cost per night is $140 per suite and consists of the following.

Variable direct labor and materials cost	$ 30
Fixed cost [($6,022,500/150 suites) ÷ 365 days]	110
Total cost per night per suite	$140

The hotel manager received an offer to hold the local Rotary Club annual meeting at the hotel in March, which is the hotel's low season with an occupancy rate of under 50%. The Rotary Club would reserve 50 suites for three nights if the hotel could offer a 50% discount, or a rate of $125 per night. The hotel manager is inclined to reject the offer because the cost per suite per night is $140. The manager believes that if 50 suites are offered at the rate of $125 per night for three nights, the hotel would lose $2,250, computed as ($125 − $140) × 50 suites × 3 nights.

Required

Prepare an analysis of this offer for the hotel manager. Explain (with supporting computations) whether the offer from the Rotary Club should be accepted or rejected.

Check $14,250 contribution margin

Problem 6-5A

Income reporting, absorption costing, and managerial ethics

C2 P2 A1

Safety Chemical produces and sells an ice-melting granular used on roadways and sidewalks in winter. It annually produces and sells about 100 tons of its granular. In its nine-year history, the company has never reported a net loss. However, because of this year's unusually mild winter, projected demand for its product is only 60 tons. Based on its predicted production and sales of 60 tons, the company projects the following income statement (under absorption costing).

Sales (60 tons at $21,000 per ton)	$1,260,000
Cost of goods sold (60 tons at $16,000 per ton)	960,000
Gross margin	300,000
Selling and administrative expenses	318,600
Net loss	$ (18,600)

Its product cost information follows and consists mainly of fixed cost because of its automated production process requiring expensive equipment.

Variable direct labor and material costs per ton	$ 3,500
Fixed cost per ton ($750,000 ÷ 60 tons)	12,500
Total product cost per ton	$16,000

Selling and administrative expenses consist of variable selling and administrative expenses of $310 per ton and fixed selling and administrative expenses of $300,000 per year. The company's president is concerned about the adverse reaction from its creditors and shareholders if the projected net loss is reported. The operations manager mentions that since the company has large storage capacity, it can report a net income by keeping its production at the usual 100-ton level even though it expects to sell only 60 tons. The president was puzzled by the suggestion that the company can report income by producing more without increasing sales.

Required

Check (1) $281,400 absorption costing income

1. Can the company report a net income by increasing production to 100 tons and storing the excess production in inventory? Your explanation should include an income statement (using absorption costing) based on production of 100 tons and sales of 60 tons.
2. Should the company produce 100 tons given that projected demand is 60 tons? Explain, and also refer to any ethical implications of such a managerial decision.

PROBLEM SET B

Problem 6-1B

Converting an absorption costing income statement to a variable costing income statement

P1 P2 P4 A1

Mitchell Company began operations this year. During this first year, the company produced 300,000 units and sold 250,000 units. Its income statement under absorption costing for its first year of operations follows.

Sales (250,000 units × $18 per unit)		$4,500,000
Cost of goods sold		
Beginning inventory	$ 0	
Cost of goods manufactured (300,000 units × $7.50 per unit)	2,250,000	
Cost of good available for sale	2,250,000	
Ending inventory (50,000 × $7.50)	375,000	
Cost of goods sold		1,875,000
Gross margin		2,625,000
Selling and administrative expenses		2,200,000
Net income		$ 425,000

Additional Information

a. Selling and administrative expenses consist of $1,200,000 in annual fixed expenses and $4 per unit in variable selling and administrative expenses.

b. The company's product cost of $7.50 per unit is computed as follows.

Direct materials	$2.00 per unit
Direct labor	$2.40 per unit
Variable overhead	$1.60 per unit
Fixed overhead ($450,000/300,000 units)	$1.50 per unit

Required

1. Prepare the company's income statement under variable costing.
2. Explain any difference between the company's income under variable costing (from part 1) and the income reported above.

Check (1) Variable costing income, $350,000

Problem 6-2B

Converting an absorption costing income statement to a variable costing income statement (two consecutive years)

P2 P4 A1

Flores Company produces a single product. Its income statement under absorption costing for its first two years of operation follow.

	2008	2009
Sales ($35 per unit)	$1,925,000	$2,275,000
Cost of goods sold ($26 per unit)	1,430,000	1,690,000
Gross margin	495,000	585,000
Selling and administrative expenses	465,000	495,000
Net income	$ 30,000	$ 90,000

Additional Information

a. Sales and production data for these first two years follow.

	2008	2009
Units produced	60,000	60,000
Units sold	55,000	65,000

b. Its variable cost per unit and total fixed costs are unchanged during 2008 and 2009. Its $26 per unit product cost consists of the following.

Direct materials	$ 4
Direct labor	6
Variable overhead	8
Fixed overhead ($480,000/60,000 units)	8
Total product cost per unit	$26

c. Its selling and administrative expenses consist of the following.

	2008	2009
Variable selling and administrative ($3 per unit)	$165,000	$195,000
Fixed selling and administrative	300,000	300,000
Total selling and administrative	$465,000	$495,000

Required

1. Prepare this company's income statements under variable costing for each of its first two years.
2. Explain any difference between the absorption costing income and the variable costing income for these two years.

Check (1) 2008 net loss, $(10,000)

Problem 6-3B

CVP analysis, absorption costing, and variable costing

A1 A2

Refer to information about Flores Company in Problem 6-2B. In the company's planning documents, Roberto Flores, the company president, reports that the company's break-even volume in unit sales is 55,715 units. This break-even point is computed as follows.

$$\text{Break-even volume} = \frac{\text{Total fixed cost}}{\text{Contribution margin per unit}} = \frac{\$780{,}000}{\$14} = 55{,}715 \text{ units}$$

Total fixed cost consists of $480,000 in fixed production cost and $300,000 in fixed selling and administrative expenses. The contribution margin per unit of $14 is computed by deducting the $21 variable cost per unit (which consists of $18 in variable production cost and $2 in variable selling

and administrative cost) from the $35 sales price per unit. In 2008, it sold 55,000 units, which was below break-even, and Roberto Flores was concerned that the company's income statement would show a net loss. To his surprise, the company's 2008 income statement revealed a net income of $30,000 as shown in Problem 6-2B.

Required

Prepare a one-half-page memorandum to the president explaining how the company could report net income when it sold less than its break-even volume in units.

Problem 6-4B

Variable cost analysis for a services company

C3

Elegant Plaza Hotel is a luxury hotel with 400 rooms. Its regular room rate is $300 per night per room. The hotel's cost is $120 per night per room and consists of the following.

Variable direct labor and materials cost	$ 40
Fixed cost ([$18,250,000/400 rooms] ÷ 365 days)	125
Total cost per night per room	$165

The hotel manager received an offer to hold the Junior States of America (JSA) convention at the hotel in February, which is the hotel's low season with an occupancy rate of under 45%. JSA would reserve 100 rooms for four nights if the hotel could offer a 50% discount, or a rate of $150 per night. The hotel manager is inclined to reject the offer because the cost per room per night is $165. The manager believes that if 100 rooms are offered at the rate of $150 per night for four nights, the hotel would lose $6,000, computed as ($150 − $165) × 100 rooms × 4 nights.

Required

Check Contribution margin, $44,000

Prepare an analysis of this offer for the hotel manager. Explain (with supporting computations) whether the offer from JSA should be accepted or rejected.

Problem 6-5B

Income reporting, absorption costing, and managerial ethics

C2 P2 A1

Proto Chemical produces and sells an ice-melting granular used on roadways and sidewalks in winter. The company annually produces and sells about 300,000 lbs of its granular. In its ten-year history, the company has never reported a net loss. Because of this year's unusually mild winter, projected demand for its product is only 250,000 lbs. Based on its predicted production and sales of 250,000 lbs, the company projects the following income statement under absorption costing.

Sales (250,000 lbs at $8 per lb.)	$2,000,000
Cost of goods sold (250,000 lbs at $6.80 per lb.)	1,700,000
Gross margin	300,000
Selling and administrative expenses	450,000
Net loss	$ (150,000)

Its product cost information follows and consists mainly of fixed production cost because of its automated production process requiring expensive equipment.

Variable direct labor and materials costs per lb.	$2.00
Fixed production cost per lb ($1,200,000/250,000 lbs.)	4.80
Total product cost per lb.	$6.80

The company's selling and administrative expenses are all fixed. The president is concerned about the adverse reaction from its creditors and shareholders if the projected net loss is reported. The controller suggests that since the company has large storage capacity, it can report a net income by keeping its production at the usual 300,000 lbs level even though it expects to sell only 250,000 lbs. The president was puzzled by the suggestion that the company can report a profit by producing more without increasing sales.

Required

1. Can the company report a net income by increasing production to 300,000 lbs and storing the excess production in inventory? Your explanation should include an income statement (using absorption costing) based on production of 300,000 lbs and sales of 250,000 lbs.
2. Should the company produce 300,000 lbs given that projected demand is 250,000 lbs? Explain, and also refer to any ethical implications of such a managerial decision.

Check (1) $50,000 absorption income

SERIAL PROBLEM

(This serial problem began in Chapter 1 and continues through most of the book. If previous chapter segments were not completed, the serial problem can begin at this point. It is helpful, but not necessary, to use the Working Papers that accompany the book.)

SP 6 Adriana Lopez expected sales of her line of computer workstation furniture to equal 300 workstations (at a sales price of $3,000) for 2010. The workstations' manufacturing costs include the following.

Direct materials	$800 per unit
Direct labor	$400 per unit
Variable overhead	$100 per unit
Fixed overhead	$24,000 per year

The selling expenses related to these workstations follow.

Variable selling expenses	$50 per unit
Fixed selling expenses	$4,000 per year

Adriana is considering how many workstations to produce in 2010. She is confident that she will be able to sell any workstations in her 2010 ending inventory during 2011. However, Adriana does not want to overproduce as she does not have sufficient storage space for many more workstations.

Required

1. Compute Success Systems' absorption costing income assuming
   a. 300 workstations are produced.
   b. 320 workstations are produced.
2. Compute Success Systems' variable costing income assuming
   a. 300 workstations are produced.
   b. 320 workstations are produced.
3. Explain to Adriana any differences in the income figures determined in parts 1 and 2. How should Adriana use the information from parts 1 and 2 to help make production decisions?

BEYOND THE NUMBERS

REPORTING IN ACTION

BTN 6-1 One of many services **Best Buy** offers is its Geek Squad (**GeekSquad.com**), who "are ready to take the hassle out of your technology woes." The Geek Squad offers a wide variety of services, including repairing crashed hard drives, containing virus outbreaks, removing spyware, and helping protect and back up important data.

Required

For Best Buy to determine what services and products to offer through its Geek Squad, would variable or absorption costing be a better approach to analyze those new services or products? Explain.

COMPARATIVE ANALYSIS

BTN 6-2 To compete with **Best Buy's Geek Squad (GeekSquad.com)**, **Circuit City** recently began a similar service named **firedog (firedog.com)**. Firedog offers in-home, in-store, and online services for computer repair, installation and support, and home theater product installation.

Required

1. What are some of the costs that Circuit City had to consider when deciding whether to offer the firedog service? Are those costs different from what Best Buy must consider when offering additional new Geek Squad products or services? Explain.
2. Would variable or absorption costing be more useful to Circuit City in analyzing whether firedog is profitable? Explain.

ETHICS CHALLENGE

C2 P2 A1

BTN 6-3 FDP Company produces a variety of home security products. Gary Price, the company's president, is concerned with the fourth quarter market demand for the company's products. Unless something is done in the last two months of the year, the company is likely to miss its earnings expectation of Wall Street analysts. Price still remembers when FDP's earnings were below analysts' expectation by two cents a share three years ago, and the company's share price fell 19% the day earnings were announced. In a recent meeting, Price told his top management that something must be done quickly. One proposal by the marketing vice president was to give a deep discount to the company's major customers to increase the company's sales in the fourth quarter. The company controller pointed out that while the discount could increase sales, it may not help the bottom line; to the contrary, it could lower income. The controller said, "Since we have enough storage capacity, we might simply increase our production in the fourth quarter to increase our reported profit."

Required

1. Gary Price is not sure how the increase in production without a corresponding increase in sales could help boost the company's income. Explain to Price how reported income varies with respect to production level.
2. Is there an ethical concern in this situation? If so, which parties are affected? Explain.

COMMUNICATING IN PRACTICE

C2

BTN 6-4 Mertz Chemical has three divisions. Its consumer product division faces strong competition from companies overseas. During its recent teleconference, Ryan Peterson, the consumer product division manager, reported that his division's sales for the current year were below its break-even point. However, when the division's annual reports were received, Billie Mertz, the company president, was surprised that the consumer product division actually reported a profit of $264,000. How could this be possible?

Required

Assume that you work in the corporate controller's office. Write a one-half-page memorandum to the president explaining how the division can report income even if its sales are below the break-even point.

TAKING IT TO THE NET

C1

BTN 6-5 This chapter discussed the variable costing method and how to use variable costing information to make various business decisions. We also can find several Websites on variable costing and its business applications.

Required

1. Review the Website of **Value Based Management** at ValueBasedManagement.net. Identify and print the site page on the topic of variable costing **(**ValueBasedManagement.net/Methods–Variable–Costing.html**)**.
2. What other phrases are used in practice for *variable costing*?
3. According to this Website, what are the consequences of variable costing for profit calculation?

BTN 6-6 This chapter identified many decision contexts in which variable costing information is more relevant than absorption costing. However, absorption costing is still used by many companies and remains the only acceptable basis for external (and tax) reporting.

TEAMWORK IN ACTION

C1 C5

Required

Break into teams and identify at least one specific decision context in which absorption costing information is more relevant than variable costing. Be prepared to discuss your answers in class.

BTN 6-7 **Bonobos**, which was launched by entrepreneurial friends Brian Spaly and Andy Dunn, produces high-quality pants in unique styles and limited quantities. Selling prices for a pair of Bonobos pants typically range from $110 per pair to $350 per pair.

ENTREPRENEURIAL DECISION

C1

Required

1. Based on information in this chapter's opener, identify at least four examples of the types of costs that likely explain the wide range of selling prices for Bonobos' pants.
2. The founders of Bonobos use variable costing in their business decisions. If Bonobos used absorption costing, would you expect the company's income to be more, less than, or about the same as its income measured under variable costing? Explain.

BTN 6-8 Visit a local hotel and observe its daily operating activities. The costs associated with some of its activities are variable while others are fixed with respect to occupancy levels.

HITTING THE ROAD

C3

Required

1. List cost items that are likely variable for the hotel.
2. List cost items that are likely fixed for the hotel.
3. Compare the fixed cost items with variable cost items. Rank costs within each category based on your perception of which ones you believe are the larger.
4. Based on your observations and the answers to parts 1 through 3, explain why many hotels offer discounts as high as 50% or more during their low occupancy season.

BTN 6-9 Assume that **DSG international** (**DSGiplc.com**) is considering offering a service similar to **Best Buy**'s Geek Squad. However, instead of developing the group internally, they are considering buying a company that already offers such services.

GLOBAL DECISION

C1 A1

Required

Would absorption or variable costing be most useful to DSG in evaluating whether to acquire an existing business that provides services similar to the Geek Squad? Explain.

ANSWERS TO MULTIPLE CHOICE QUIZ

1. c; $14, computed as $3 + $5 + $3 + ($3,000/1,000 units).
2. a; $11, computed as $3 + $5 + $3 (consisting of all variable product costs).
3. a
4. c
5. b