

CHAPTER 5

VARIABLE COSTING

AGENDA

1. Absorption and variable costing.
2. Unit product cost comparison.
3. Income statement comparison.
4. Extended example—fluctuating sales.
5. Comparative income effects.
6. Extended example—fluctuating production.
7. Advantages of variable costing.

ABSORPTION AND VARIABLE COSTING

Variable costing and absorption costing are alternative methods of determining unit product costs. They affect inventory valuations and net operating income.

Absorption costing

Absorption costing was used in earlier chapters and is generally considered to be required for external financial reports. Under absorption costing, product costs include *all* manufacturing costs:

- Direct materials.
- Direct labor.
- Variable manufacturing overhead.
- Fixed manufacturing overhead.

Under absorption costing, the following costs are treated as period expenses and are excluded from product costs:

- Variable selling and administrative costs.
- Fixed selling and administrative costs.

Variable costing

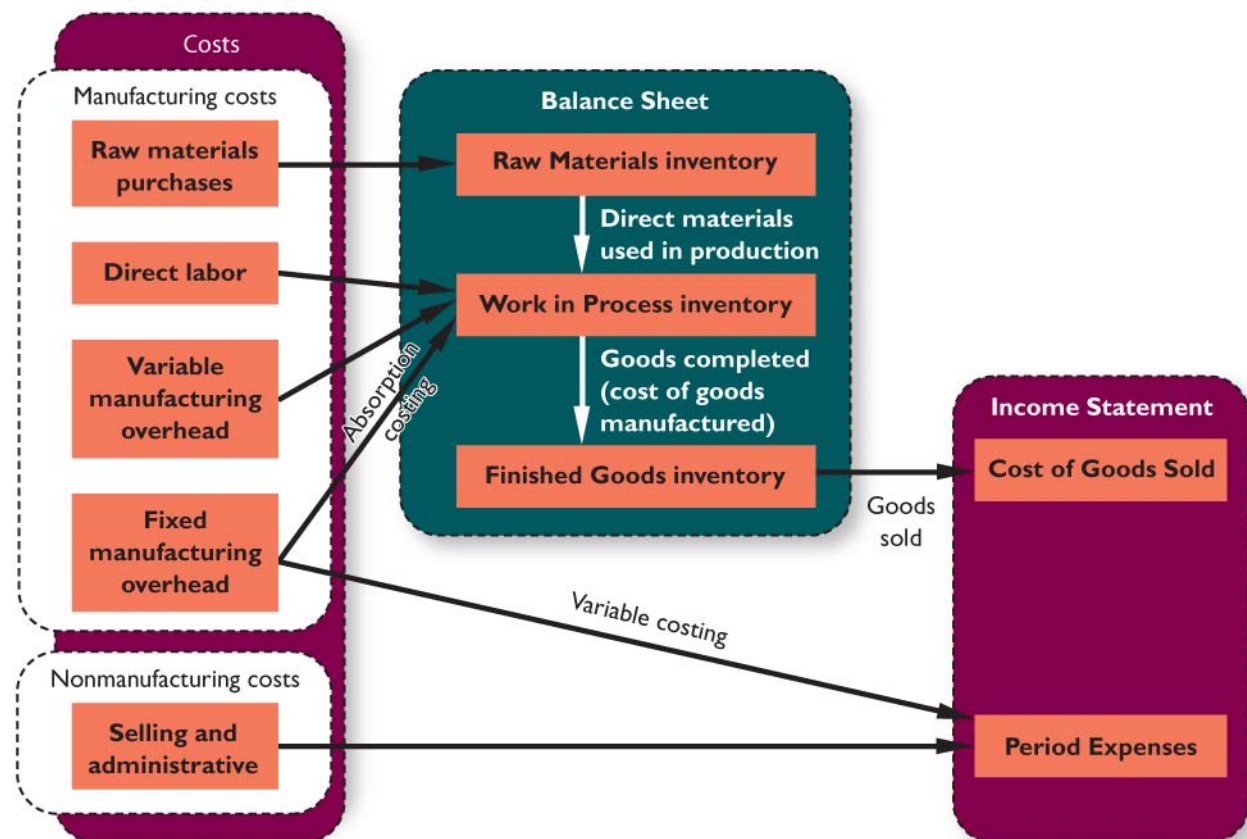
Variable costing is an alternative for internal management reports. Under variable costing, product costs include only the *variable* manufacturing costs:

- Direct materials.
- Direct labor (unless fixed).
- Variable manufacturing overhead.

Under variable costing, the following costs are treated as period expenses and are excluded from product costs:

- Fixed manufacturing overhead.
- Variable selling and administrative costs.
- Fixed selling and administrative costs.

Classification of costs under variable and absorption costing



UNIT PRODUCT COST COMPARISON

- Unit product costs differ between variable and absorption costing.

EXAMPLE: Harvey Company produces a single product.

Number of units produced annually.....	25,000
Selling price per unit.....	\$30
Variable costs per unit:	
Direct materials, direct labor, and variable manufacturing overhead.....	\$10
Variable selling and administrative expense	\$3
Fixed costs per year:	
Fixed manufacturing overhead.....	\$150,000
Fixed selling and administrative expense.....	\$100,000

Unit product costs are computed as follows:

	<i>Absorption Costing</i>	<i>Variable Costing</i>
Direct materials, direct labor, and variable manufacturing overhead		
Fixed manufacturing overhead.....		
Total unit product cost.....		

- Selling and administrative expenses are always treated as period costs and are expensed in the current period; they are not treated as product costs under either costing method.

INCOME STATEMENT COMPARISON

Harvey Company had no beginning inventory, produced 25,000 units, and sold 20,000 units last year.

<i>Absorption Costing</i>	
Sales	\$600,000
Cost of goods sold	<u>320,000</u>
Gross margin.....	280,000
Selling and administrative expense	<u>160,000</u>
Net operating income	<u>\$120,000</u>

<i>Variable Costing</i>	
Sales	<u>\$600,000</u>
Variable expenses:	
Variable cost of goods sold	200,000
Variable selling and administrative expense	<u>60,000</u>
Total variable expenses	<u>260,000</u>
Contribution margin	<u>340,000</u>
Fixed expenses:	
Fixed manufacturing overhead.....	150,000
Fixed selling and administrative expense.....	<u>100,000</u>
Total fixed expenses	<u>250,000</u>
Net operating income	<u>\$ 90,000</u>

How much are the cost of goods sold and the ending inventory under the two costing methods?

	<i>Cost of Goods Sold</i>	<i>Ending Inventory</i>
<i>Absorption costing</i>		
Variable manufacturing costs		
(20,000 units × \$10 per unit)	\$200,000	
(5,000 units × \$10 per unit)		\$50,000
Fixed manufacturing overhead		
(20,000 units × \$6 per unit)	120,000	
(5,000 units × \$6 per unit)		<u>30,000</u>
Total	<u>\$320,000</u>	<u>\$80,000</u>

<i>Variable costing</i>		
Variable manufacturing costs		
(20,000 units × \$10 per unit)	\$200,000	
(5,000 units × \$10 per unit)		<u>\$50,000</u>
Total	<u>\$200,000</u>	<u>\$50,000</u>

RECONCILIATION OF NET OPERATING INCOMES:

Variable costing net operating income	\$ 90,000
Add fixed manufacturing overhead cost deferred in inventory under absorption costing (5,000 units × \$6 per unit)	<u>30,000</u>
Absorption costing net operating income	<u>\$120,000</u>

EXTENDED EXAMPLE—FLUCTUATING SALES

EXAMPLE: Holland Company produces a single product.

Number of units produced annually	5,000
Selling price per unit	\$15
Variable costs per unit:	
Direct materials, direct labor, and variable manufacturing overhead.....	\$5
Variable selling and administrative expense.....	\$1
Fixed costs per year:	
Fixed manufacturing overhead	\$15,000
Fixed selling and administrative expense	\$21,000

Unit product costs are computed as follows:

	<i>Absorption Costing</i>	<i>Variable Costing</i>
Direct materials, direct labor, and variable manufacturing overhead	\$5	\$5
Fixed manufacturing overhead (\$15,000 ÷ 5,000 units).....	<u>3</u>	<u>—</u>
Total unit product cost	<u>\$8</u>	<u>\$5</u>

Income statements using both costing methods over a three-year period are provided on the following page. (Note the computation of the variable cost of goods sold on the variable costing income statements. The method used is simpler than the method used in the previous example.)

FLUCTUATING SALES (continued)

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>
Units in beginning inventory	0	0	1,000
Units produced	5,000	5,000	5,000
Units sold	5,000	4,000	6,000
Units in ending inventory	0	1,000	0

Absorption costing

Sales (@ \$15 per unit)	<u>\$75,000</u>	<u>\$60,000</u>	<u>\$90,000</u>
Cost of goods sold (@ \$8 per unit)	<u>40,000</u>	<u>32,000</u>	<u>48,000</u>
Gross margin	35,000	28,000	42,000
Selling and administrative expense	<u>26,000</u>	<u>25,000</u>	<u>27,000</u>
Net operating income	<u>\$ 9,000</u>	<u>\$ 3,000</u>	<u>\$15,000</u>

Variable costing

Sales (@ \$15 per unit)	<u>\$75,000</u>	<u>\$60,000</u>	<u>\$90,000</u>
Variable expenses:			
Variable cost of goods sold			
(@ \$5 per unit)	25,000	20,000	30,000
Variable selling and administrative expense			
(@ \$1 per unit)	<u>5,000</u>	<u>4,000</u>	<u>6,000</u>
Total variable expenses	<u>30,000</u>	<u>24,000</u>	<u>36,000</u>
Contribution margin	<u>45,000</u>	<u>36,000</u>	<u>54,000</u>
Fixed expenses:			
Fixed manufacturing overhead	15,000	15,000	15,000
Fixed selling and administrative expense	<u>21,000</u>	<u>21,000</u>	<u>21,000</u>
Total fixed expenses	<u>36,000</u>	<u>36,000</u>	<u>36,000</u>
Net operating income	<u>\$ 9,000</u>	<u>\$ 0</u>	<u>\$18,000</u>

RECONCILING NET OPERATING INCOME:

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>
Variable costing net operating income	\$9,000	\$ 0	\$18,000
<u>Add</u> fixed manufacturing overhead cost deferred in inventory under absorption costing (1,000 units × \$3 per unit)		3,000	
<u>Deduct</u> fixed manufacturing overhead cost released from inventory under absorption costing (1,000 units × \$3 per unit)			<u>(3,000)</u>
Absorption costing net operating income	<u>\$9,000</u>	<u>\$3,000</u>	<u>\$15,000</u>

COMPARATIVE INCOME EFFECTS —VARIABLE AND ABSORPTION COSTING

<i>Relation Between Production and Sales</i>	<i>Relation Between Variable and Absorption Costing Net Operating Incomes</i>
Units produced = Unit sales (No change in inventory)	Absorption costing NI = Variable costing NI*
Units produced > Unit sales (Inventory increases)	Absorption costing NI > Variable costing NI **
Units produced < Unit sales (Inventory decreases)	Absorption costing NI < Variable costing NI #

* Under lean production, inventories are reduced drastically and changes in inventories are small. Therefore, absorption costing net operating income tends to equal variable costing net operating income under lean production.

** Net operating income will be higher under absorption costing than under variable costing because fixed manufacturing overhead cost will be *deferred* in inventory under absorption costing.

Net operating income will be lower under absorption costing than under variable costing because fixed manufacturing overhead cost will be *released* from inventory under absorption costing.

EXTENDED EXAMPLE—FLUCTUATING PRODUCTION

EXAMPLE: Suppose all of the facts are the same as in the previous example of Holland Company except that production and sales are as follows:

	Year 1	Year 2	Year 3
Units in beginning inventory	0	0	1,000
Units produced	5,000	6,000	4,000
Units sold	5,000	5,000	5,000
Units in ending inventory	0	1,000	0

Unit product costs are computed as follows:

	Year 1	Year 2	Year 3
<i>Absorption costing</i>			
Direct materials, direct labor, and variable manufacturing overhead	\$5.00	\$5.00	\$5.00
Fixed manufacturing overhead:			
(\$15,000 ÷ 5,000 units)	3.00		
(\$15,000 ÷ 6,000 units)		2.50	
(\$15,000 ÷ 4,000 units)			3.75
Unit product cost	<u>\$8.00</u>	<u>\$7.50</u>	<u>\$8.75</u>
<i>Variable costing</i>			
Direct materials, direct labor, and variable manufacturing overhead	<u>\$5.00</u>	<u>\$5.00</u>	<u>\$5.00</u>
Unit product cost	<u>\$5.00</u>	<u>\$5.00</u>	<u>\$5.00</u>

FLUCTUATING PRODUCTION (continued)

	Year 1	Year 2	Year 3
<i>Absorption costing</i>			
Sales (@ \$15 per unit)	\$75,000	\$75,000	\$75,000
Cost of goods sold (5,000 units × \$8); (5,000 units × \$7.50); (1,000 units × \$7.50) + (4,000 units × \$8.75)	<u>40,000</u>	<u>37,500</u>	<u>42,500</u>
Gross margin	35,000	37,500	32,500
Selling and administrative expense	<u>26,000</u>	<u>26,000</u>	<u>26,000</u>
Net operating income	<u>\$ 9,000</u>	<u>\$11,500</u>	<u>\$6,500</u>
<i>Variable costing</i>			
Sales (@ \$15 per unit)	<u>\$75,000</u>	<u>\$75,000</u>	<u>\$75,000</u>
Variable expenses:			
Variable cost of goods sold	25,000	25,000	25,000
Variable selling and administrative expense	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>
Total variable expenses	<u>30,000</u>	<u>30,000</u>	<u>30,000</u>
Contribution margin	<u>45,000</u>	<u>45,000</u>	<u>45,000</u>
Fixed expenses:			
Fixed manufacturing overhead	15,000	15,000	15,000
Fixed selling and administrative expense	<u>21,000</u>	<u>21,000</u>	<u>21,000</u>
Total fixed expenses	<u>36,000</u>	<u>36,000</u>	<u>36,000</u>
Net operating income	<u>\$ 9,000</u>	<u>\$ 9,000</u>	<u>\$ 9,000</u>

RECONCILING NET OPERATING INCOME:

	Year 1	Year 2	Year 3
Variable costing net operating income	\$9,000	\$9,000	\$9,000
Add fixed manufacturing overhead cost deferred in inventory under absorption costing (1,000 units × \$2.50 per unit)		2,500	
Deduct fixed manufacturing overhead cost released from inventory under absorption costing (1,000 units × \$2.50 per unit)			(2,500)
Absorption costing net operating income	<u>\$9,000</u>	<u>\$11,500</u>	<u>\$6,500</u>

ADVANTAGES OF VARIABLE COSTING

- + Variable costing is easy to use with CVP analysis.
- + Variable costing net operating income is only affected by changes in unit sales; therefore, it provides clearer explanations than absorption costing of why net operating income changes from one period to the next.
- + Variable costing supports decision making better than absorption costing. Absorption costing treats fixed overhead as though it is a variable cost which may lead to flawed pricing decisions and discontinuation decisions.
- + Variable costing readily adapts to the Theory of Constraints by treating direct labor as a fixed cost rather than a variable cost.

Contrasting Variable and Absorption Costing

Dexter Corporation produces and sells a single product, a wooden hand loom for weaving small items such as scarves. Selected cost and operating data relating to the product for two years are given below:

Selling price per unit	\$50
Manufacturing costs:	
Variable per unit produced:	
Direct materials	\$11
Direct labor	\$6
Variable overhead	\$3
Fixed per year	\$120,000
Selling and administrative costs:	
Variable per unit sold	\$4
Fixed per year	\$70,000

	Year 1	Year 2
Units in beginning inventory	0	2,000
Units produced during the year	10,000	6,000
Units sold during the year	8,000	8,000
Units in ending inventory	2,000	0

Required:

1. Assume the company uses absorption costing.
 - a. Compute the unit product cost in each year.
 - b. Prepare an income statement for each year.
2. Assume the company uses variable costing.
 - a. Compute the unit product cost in each year.
 - b. Prepare an income statement for each year.
3. Reconcile the variable costing and absorption costing net operating incomes.

Exercise 5-6 Variable Costing, Unit Product Cost and Income Statement; Breakeven

Chuck Wagon Grills, Inc., makes a single product—a handmade specialty barbecue grill that it sells for \$210. Data for last year's operations follow:

Units in beginning inventory	0
Units produced	20,000
Units sold	19,000
Units in ending inventory	1,000
Variable costs per unit:	
Direct materials	\$ 50
Direct labor	80
Variable manufacturing overhead	20
Variable selling and administrative	10
Total variable cost per unit	<u>\$160</u>
Fixed costs:	
Fixed manufacturing overhead	\$700,000
Fixed selling and administrative	<u>285,000</u>
Total fixed costs	<u>\$985,000</u>

Required:

1. Assume that the company uses variable costing. Compute the unit product cost for one barbecue grill.
2. Assume that the company uses variable costing. Prepare a contribution format income statement for the year.
3. What is the company's break-even point in terms of the number of barbecue grills sold?