

Chapter 6 – Variable Costing and Segment Reporting: Tools for Management

		Click on links
Exercise 6-5	Companywide and Segment Break-Even Analysis	Exercise 6-5
Exercise 6-6	Variable and Absorption Costing Unit Product Costs and Income Statements	Exercise 6-6
Exercise 6-7	Segmented Income Statement	Exercise 6-7
Exercise 6-9	Variable and Absorption Costing Unit Product Costs and Income Statements	Exercise 6-9
Exercise 6-10	Companywide and Segment Break-Even Analysis	Exercise 6-10

Exercise 6-5

Raleigh Company segments its business into two regions—East and West. The company prepared the contribution format segmented income statement as shown below:

	Total Company	East	West
Sales	\$ 1,050,000	\$ 600,000	\$ 450,000
Variable expenses	495,000	360,000	135,000
Contribution margin	555,000	240,000	315,000
Traceable fixed expenses	123,000	60,000	63,000
Segment margin	432,000	\$ 180,000	\$ 252,000
Common fixed expenses	185,000		
Net operating income	\$ 247,000		

Required:

1. Compute the companywide break-even point in dollar sales.
2. Compute the break-even point in dollar sales for the East Region.
3. Compute the break-even point in dollar sales for the West Region.

Requirement 1: Compute the companywide break-even point in dollar sales.

$$\begin{aligned} \text{Dollar sales for company} & & & \text{Traceable fixed expenses} + \text{Common fixed expenses} \\ \text{to break even} & = & & \text{Overall CM ratio} \\ & = & & \frac{\$123,000 + \$185,000}{0.529} \\ & = & & \$582,231 \end{aligned}$$

Requirement 2: Compute the break-even point in dollar sales for the East Region.

$$\begin{aligned} \text{Dollar sales for segment} & & & \text{Segment traceable fixed expenses} \\ \text{to break even} & = & & \text{Segment CM ratio} \\ & = & & \frac{\$60,000}{0.4} \\ & = & & \$150,000 \end{aligned}$$

Requirement 3: Compute the break-even point in dollar sales for the West Region.

$$\begin{aligned} \text{Dollar sales for segment} & & & \text{Segment traceable fixed expenses} \\ \text{to break even} & = & & \text{Segment CM ratio} \\ & = & & \frac{\$63,000}{0.7} \\ & = & & \$90,000 \end{aligned}$$

Exercise 6-6

Cheetah Company manufactures and sells a single product. The following costs were incurred during the company's first year of operations:

Variable costs per unit:	
Direct materials	\$8
Direct labor	\$12
Variable manufacturing overhead	\$6
Variable selling and administrative	\$5
Fixed costs:	
Fixed manufacturing overhead	\$440,000
Fixed selling and administrative	\$260,000

During the year, the company produced 40,000 units and sold 38,000 units. The selling price of the company's product is \$80 per unit.

Required:

1. Assume that the company uses absorption costing:
 - a. Compute the unit product cost.
 - b. Prepare an income statement for the year.
2. Assume that the company uses variable costing:
 - a. Compute the unit product cost.
 - b. Prepare an income statement for the year.

[LO1], [LO2]

Requirement 1: Assume that the company uses absorption costing. Compute the unit product cost and prepare an income statement.

Direct materials	\$ 8	Sales	\$3,040,000
Direct labor	12	Cost of goods sold	<u>1,406,000</u>
Variable manufacturing overhead	6	Gross margin	1,634,000
Fixed manufacturing overhead	<u>11</u>	Selling and administrative expenses	<u>450,000</u>
Absorption costing unit product cost	<u>\$37</u>	Net operating income	<u>\$1,184,000</u>

Requirement 2: Assume that the company uses variable costing. Compute the unit product cost and prepare an income statement.

		Sales		\$3,040,000
Direct materials	\$8	Variable expenses:		
Direct labor	12	Variable cost of goods sold	988,000	
Variable manufacturing overhead	<u>6</u>	Variable selling expense	<u>190,000</u>	<u>1,178,000</u>
Variable costing unit product cost	<u>\$26</u>	Contribution margin		1,862,000
		Fixed expenses:		
		Fixed manufacturing overhead	440,000	
		Fixed selling and administrative expense	<u>260,000</u>	<u>700,000</u>
		Net operating income		<u>\$1,162,000</u>

Exercise 6-7

Ranjani Company segments its income statement into its East and West Divisions. The company's overall sales, contribution margin ratio, and net operating income are \$600,000, 55%, and \$15,000, respectively. The East Division's contribution margin and contribution margin ratio are \$130,000 and 65%, respectively. The West Division's segment margin is \$40,000. The company has \$80,000 of common fixed expenses that cannot be traced to either division.

Required:

1. Prepare an income statement for Ranjani Company that uses the contribution format and is segmented by divisions. In addition, for the company as a whole and for each segment, show each item on the segmented income statements as a percent of sales.

Required: Prepare an income statement for Ranjani Company that uses the contribution format and is segmented by divisions. In addition, for the company as a whole and for each segment, show each item on the segmented income statements as a percent of sales.

	Total Company		Divisions			
			East		West	
	Amount	%	Amount	%	Amount	%
Sales	\$600,000	100.0%	\$200,000	100.0%	\$400,000	100.0%
Variable expenses	<u>270,000</u>	<u>45.0%</u>	<u>\$70,000</u>	<u>35.0%</u>	<u>200,000</u>	<u>50.0%</u>
Contribution margin	330,000	55.0%	130,000	65.0%	200,000	50.0%
Traceable fixed expenses	<u>235,000</u>	<u>39.2%</u>	<u>75,000</u>	<u>37.5%</u>	<u>\$160,000</u>	<u>40.0%</u>
Territorial segment margin	95,000	15.8%	<u>55,000</u>	<u>27.5%</u>	<u>\$ 40,000</u>	<u>10.0%</u>
Common fixed expenses	<u>80,000</u>	<u>13.3%</u>				
Net operating income	<u>\$ 15,000</u>	<u>2.5%</u>				

Exercise 6-9

Wentzel Company manufactures and sells one product. The following information pertains to each of the company's first two years of operations:

Variable costs per unit:			
Manufacturing:			
Direct materials	\$15	Fixed costs per year:	
Direct labor	\$10	Fixed manufacturing overhead	\$525,000
Variable manufacturing overhead	\$7	Fixed selling and administrative	\$110,000
Variable selling and administrative	\$1		

During its first year of operations, Wentzel produced 75,000 units and sold 60,000 units. During its second year of operations, it produced 60,000 units and sold 75,000 units. The selling price of the company's product is \$58 per unit.

Required:

1. Assume that the company uses variable costing:
 - a. Compute the unit product cost for Year 1 and Year 2.
 - b. Prepare an income statement for Year 1 and Year 2.
2. Assume that the company uses absorption costing:
 - a. Compute the unit product cost for Year 1 and Year 2.
 - b. Prepare an income statement for Year 1 and Year 2.
3. Explain the difference between variable costing and absorption costing net operating income in Year 1. Also, explain why the two net operating incomes differ in Year 2.

[LO1], [LO2], [LO3]

Requirement 1: Assume that the company uses variable costing. Compute the unit product cost and prepare an income statement.

	Year 1	Year 2
Direct materials	\$15	\$15
Direct labor	10	10
Variable manufacturing overhead	<u>7</u>	<u>7</u>
Variable costing unit product cost	<u>\$32</u>	<u>\$32</u>

	Year 1	Year 2
Sales	\$3,480,000	\$4,350,000
Variable expenses:		
Variable cost of goods sold	1,920,000	2,400,000
Variable selling expense	<u>60,000</u>	<u>75,000</u>
Contribution margin	1,500,000	1,875,000
Fixed expenses:		
Fixed manufacturing overhead	525,000	525,000
Fixed selling and administrative expense	<u>110,000</u>	<u>110,000</u>
Net operating income	<u>\$865,000</u>	<u>\$1,240,000</u>

Requirement 2: Assume that the company uses absorption costing. Compute the unit product cost and prepare an income statement.

	Year 1	Year 2
Direct materials	\$ 15.00	\$ 15.00
Direct labor	10.00	10.00
Variable manufacturing overhead	7.00	7.00
Fixed manufacturing overhead	<u>7.00</u>	<u>8.75</u>
Absorption costing unit product cost	<u>\$ 39.00</u>	<u>\$ 40.75</u>

	Year 1	Year 2
Sales	\$ 3,480,000	\$ 4,350,000
Cost of goods sold	<u>2,340,000</u>	<u>3,030,000</u>
Gross margin	1,140,000	1,320,000
Selling and administrative expenses	<u>170,000</u>	<u>185,000</u>
Net operating income	<u>\$ 970,000</u>	<u>\$ 1,135,000</u>

Requirement 3: Explain the difference between variable costing and absorption costing net operating income in Year 1. Also, explain why the two net operating incomes differ in Year 2.

	Year 1	Year 2
Units in beginning inventory	0	15,000
+ Units produced	75,000	60,000
– Units sold	<u>60,000</u>	<u>75,000</u>
= Units in ending inventory	<u>15,000</u>	<u>0</u>

	Year 1	Year 2
Fixed manufacturing overhead in ending inventory (15,000 × \$7/unit)	\$ 105,000	\$ 0
Deduct: Fixed manufacturing overhead in beginning inventory (15,000 × \$7/unit)	<u>0</u>	<u>105,000</u>
Manufacturing overhead deferred in (released from) inventory	<u>\$ 105,000</u>	<u>\$ (105,000)</u>

	Year 1	Year 2
Variable costing net operating income	\$ 865,000	\$ 1,240,000
Add: Fixed manufacturing overhead cost deferred in inventory under absorption costing	105,000	
Deduct: Fixed manufacturing overhead cost released from inventory under absorption costing	<u>0</u>	<u>(105,000)</u>
Absorption costing net operating income	<u>\$ 970,000</u>	<u>\$ 1,135,000</u>

Exercise 6-10

Wilson Company segments its business into two regions—North and South. The company prepared the contribution format segmented income statement as shown below:

	Total Company	North	South
Sales	\$ 650,000	\$ 400,000	\$ 250,000
Variable expenses	315,000	240,000	75,000
Contribution margin	335,000	160,000	175,000
Traceable fixed expenses	123,000	60,000	63,000
Segment margin	212,000	\$ 100,000	\$ 112,000
Common fixed expenses	89,000		
Net operating income	\$ 123,000		

Required:

1. Compute the companywide break-even point in dollar sales.
2. Compute the break-even point in dollar sales for the North Region.
3. Compute the break-even point in dollar sales for the South Region.
4. Prepare a new segmented income statement based on the break-even dollar sales that you computed in requirements 2 and 3. What is Wilson's net income (loss) in your new segmented income statement?

Requirement 1: Compute the companywide break-even point in dollar sales.

$$\begin{aligned} \text{Dollar sales for company} & & & \text{Traceable fixed expenses} + \text{Common fixed expenses} \\ \text{to break even} & = & & \text{Overall CM ratio} \\ & = & & \frac{\$123,000 + \$89,000}{0.515} \\ & = & & \$411,650 \end{aligned}$$

Requirement 2: Compute the break-even point in dollar sales for the North Region.

$$\begin{aligned} \text{Dollar sales for segment} & & & \text{Segment traceable fixed expenses} \\ \text{to break even} & = & & \text{Segment CM ratio} \\ & = & & \frac{\$60,000}{0.4} \\ & = & & \$150,000 \end{aligned}$$

Requirement 3: Compute the break-even point in dollar sales for the South Region.

$$\begin{aligned} \text{Dollar sales for segment} & & & \text{Segment traceable fixed expenses} \\ \text{to break even} & = & & \text{Segment CM ratio} \\ & = & & \frac{\$63,000}{0.7} \\ & = & & \$90,000 \end{aligned}$$

Requirement 4: Prepare a new segmented income statement based on the break-even dollar sales that you computed in requirements 2 and 3. What is Wilson's net income (loss) in your new segmented income statement?

	Total Company	Divisions	
		North	South
	Amount	Amount	Amount
Sales	\$240,000	\$150,000	\$90,000
Variable expenses	<u>117,000</u>	<u>90,000</u>	<u>27,000</u>
Contribution margin	123,000	60,000	63,000
Traceable fixed expenses	<u>123,000</u>	<u>60,000</u>	<u>63,000</u>
Territorial segment margin	0	<u>\$ 0</u>	<u>\$ 0</u>
Common fixed expenses	<u>89,000</u>		
Net operating loss	<u>(\$89,000)</u>		