

Variable Costing and Segment Reporting: Tools for Management

Chapter 6

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Overview of Variable and Absorption Costing



Unit Cost Computations

Harvey Company produces a single product with the following information available:

Number of units produced annually	25,000
Variable costs per unit:	
Direct materials, direct labor, and variable mfg. overhead	\$ 10
Selling & administrative expenses	\$ 3
Fixed costs per year:	
Manufacturing overhead	\$ 150,000
Selling & administrative expenses	\$ 100,000

Unit Cost Computations

Unit product cost is determined as follows:

	Absorption Costing	Variable Costing
Direct materials, direct labor, and variable mfg. overhead	\$ 10	\$ 10
Fixed mfg. overhead (\$150,000 ÷ 25,000 units)	6	-
Unit product cost	\$ 16	\$ 10

Under absorption costing, all production costs, variable and fixed, are included when determining unit product cost. Under variable costing, only the variable production costs are included in product costs.

Variable and Absorption Costing Income Statements

Let's assume the following additional information for Harvey Company.

- 20,000 units were sold during the year at a price of \$30 each.
- There is no beginning inventory.

Now, let's compute net operating income using both absorption and variable costing.



Variable Costing Contribution Format Income Statement

	Variable Costing	
Sales (20,000 × \$30)		\$ 600,000
Less variable expenses:		
Variable cost of goods sold (20,000 × \$10)	\$ 200,000	
Variable selling & administrative expenses (20,000 × \$3)	60,000	260,000
Total variable expenses		<u>260,000</u>
Contribution margin		340,000
Less fixed expenses:		
Fixed manufacturing overhead	\$ 150,000	
Fixed selling & administrative expenses	100,000	250,000
Net operating income		<u>\$ 90,000</u>

Annotations:
 - Variable manufacturing costs only: points to the \$200,000 variable cost of goods sold.
 - All fixed manufacturing overhead is expensed: points to the \$150,000 fixed manufacturing overhead.

Absorption Costing Income Statement

	Absorption	
Sales (20,000 × \$30)		\$ 600,000
Less cost of goods sold: (20,000 × \$16)		<u>320,000</u>
Gross margin		280,000
Less selling & administrative expenses		
Variable (20,000 × \$3)	\$ 60,000	
Fixed	100,000	160,000
Net operating income		<u>\$ 120,000</u>

Annotation: Unit product cost. points to the \$16 unit product cost in the cost of goods sold line.

Fixed manufacturing overhead deferred in inventory is 5,000 units × \$6 = \$30,000.

Comparing the Two Methods

	Cost of Goods Sold	Ending Inventory	Period Expense	Total
Absorption costing				
Variable mfg. costs	\$ 200,000	\$ 50,000	\$ -	\$ 250,000
Fixed mfg. costs	120,000	30,000	-	150,000
	<u>\$ 320,000</u>	<u>\$ 80,000</u>	<u>\$ -</u>	<u>\$ 400,000</u>
Variable costing				
Variable mfg. costs	\$ 200,000	\$ 50,000	\$ -	\$ 250,000
Fixed mfg. costs	-	-	150,000	150,000
	<u>\$ 200,000</u>	<u>\$ 50,000</u>	<u>\$ 150,000</u>	<u>\$ 400,000</u>

Annotation: An arrow points from the \$150,000 fixed mfg. costs in the Variable costing Period Expense column to the \$30,000 fixed mfg. costs in the Absorption costing Ending Inventory column, illustrating the deferral of fixed overhead.

Comparing the Two Methods

We can reconcile the difference between absorption and variable income as follows:

Variable costing net operating income	\$ 90,000
Add: Fixed mfg. overhead costs deferred in inventory (5,000 units × \$6 per unit)	30,000
Absorption costing net operating income	<u>\$ 120,000</u>

$$\frac{\text{Fixed mfg. overhead}}{\text{Units produced}} = \frac{\$150,000}{25,000 \text{ units}} = \$6 \text{ per unit}$$

Extended Comparisons of Income Data Harvey Company - Year Two

Number of units produced	25,000
Number of units sold	30,000
Units in beginning inventory	5,000
Unit sales price	\$ 30
Variable costs per unit:	
Direct materials, direct labor, and variable mfg. overhead	\$ 10
Selling & administrative expenses	\$ 3
Fixed costs per year:	
Manufacturing overhead	\$ 150,000
Selling & administrative expenses	\$ 100,000

Unit Cost Computations

	Absorption Costing	Variable Costing
Direct materials, direct labor, and variable mfg. overhead	\$ 10	\$ 10
Fixed mfg. overhead (\$150,000 ÷ 25,000 units)	6	-
Unit product cost	<u>\$ 16</u>	<u>\$ 10</u>

Since the variable costs per unit, total fixed costs, and the number of units produced remained unchanged, the unit cost computations also remain unchanged.

Variable Costing Contribution Format Income Statement

	Variable Costing	
Sales (30,000 × \$30)		\$ 900,000
Less variable expenses:		
Variable cost of goods sold (30,000 × \$10)	\$ 300,000	
Variable selling & administrative expenses (30,000 × \$3)	90,000	390,000
Total variable expenses		
Contribution margin		510,000
Less fixed expenses:		
Fixed manufacturing overhead	\$ 150,000	
Fixed selling & administrative expenses	100,000	250,000
Net operating income		<u>\$ 260,000</u>

Annotations:
 - A box labeled "Variable manufacturing costs only." points to the Variable Costing column.
 - A box labeled "All fixed manufacturing overhead is expensed." points to the Fixed manufacturing overhead line item.

Absorption Costing Income Statement

	Absorption
Sales (30,000 × \$30)	\$ 900,000
Less cost of goods sold: (30,000 × \$16)	<u>480,000</u>
Gross margin	420,000
Less selling & administrative expenses	
Variable (30,000 × \$3)	\$ 90,000
Fixed	100,000
Net operating income	<u>\$ 230,000</u>

Unit product cost.

Fixed manufacturing overhead released from inventory is 5,000 units × \$6 = \$30,000.

Comparing the Two Methods

We can reconcile the difference between absorption and variable income as follows:

Variable costing net operating income	\$ 260,000
Deduct: Fixed manufacturing overhead costs released from inventory (5,000 units × \$6 per unit)	<u>30,000</u>
Absorption costing net operating income	<u>\$ 230,000</u>

$$\frac{\text{Fixed mfg. overhead}}{\text{Units produced}} = \frac{\$150,000}{25,000 \text{ units}} = \$6 \text{ per unit}$$

Comparing the Two Methods

Costing Method	1st Period	2nd Period	Total
Absorption	\$ 120,000	\$ 230,000	\$ 350,000
Variable	90,000	260,000	350,000



Summary of Key Insights

Relation between production and sales	Effect on inventory	Relation between variable and absorption income
Units produced = Units sold	No change in inventory	Absorption = Variable
Units produced > Units sold	Inventory increases	Absorption > Variable
Units produced < Units sold	Inventory decreases	Absorption < Variable

Variable Costing and the Theory of Constraints (TOC)

Companies involved in TOC use a form of variable costing. However, one difference of the TOC approach is that it treats direct labor as a fixed cost for three reasons:

- ❶ Many companies have a commitment to guarantee workers a minimum number of paid hours.
- ❷ Direct labor is usually not the constraint.
- ❸ TOC emphasizes the role direct laborers play in driving continuous improvement. Since layoffs often devastate morale, managers involved in TOC are extremely reluctant to lay off employees.

Decentralization and Segment Reporting

A segment is any part or activity of an organization about which a manager seeks cost, revenue, or profit data.

An Individual Store



A Sales Territory



A Service Center



Keys to Segmented Income Statements

There are two keys to building segmented income statements:



A contribution format should be used because it separates fixed from variable costs and it enables the calculation of a contribution margin.

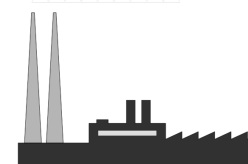


Traceable fixed costs should be separated from common fixed costs to enable the calculation of a segment margin.

Identifying Traceable Fixed Costs

Traceable fixed costs arise because of the existence of a particular segment and would disappear over time if the segment itself disappeared.

No computer division means . . .



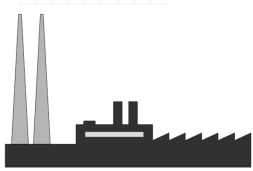
No computer division manager.



Identifying Common Fixed Costs

Common fixed costs arise because of the overall operation of the company and would not disappear if any particular segment were eliminated.

No computer division but . . .



We still have a company president.



Traceable Costs Can Become Common Costs

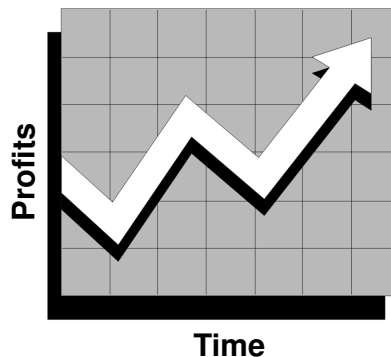
It is important to realize that the traceable fixed costs of one segment may be a common fixed cost of another segment.

For example, the landing fee paid to land an airplane at an airport is traceable to the particular flight, but it is not traceable to first-class, business-class, and economy-class passengers.

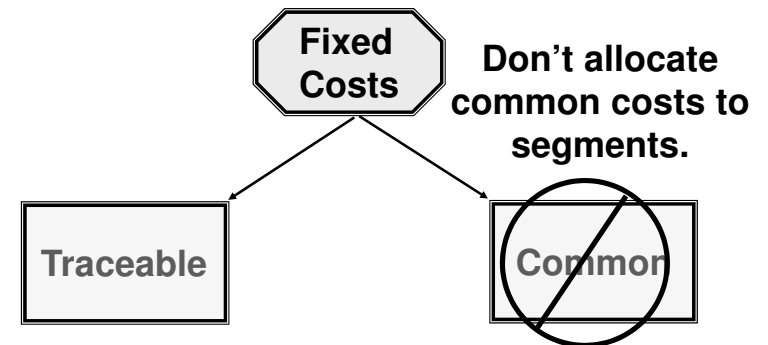


Segment Margin

The segment margin, which is computed by subtracting the traceable fixed costs of a segment from its contribution margin, is the best gauge of the long-run profitability of a segment.

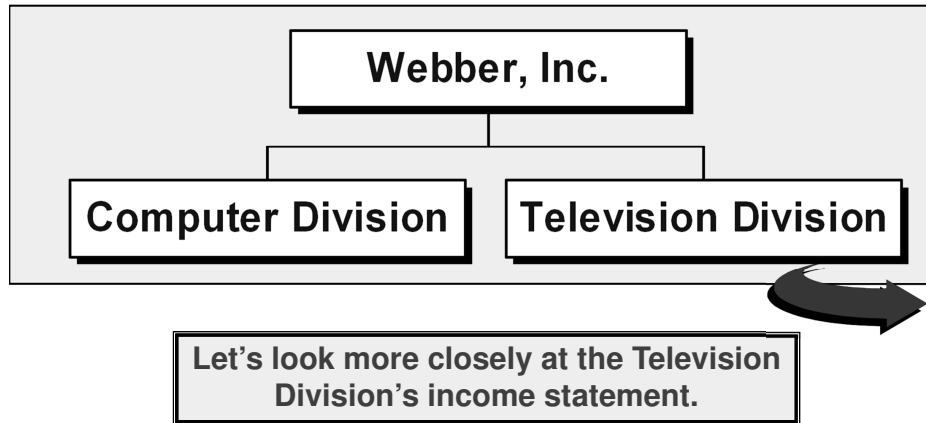


Traceable and Common Costs



Levels of Segmented Statements

Webber, Inc. has two divisions.



Levels of Segmented Statements

Our approach to segment reporting uses the contribution format.

Income Statement Contribution Margin Format Television Division		
Sales	\$ 300,000	Cost of goods sold consists of variable manufacturing costs.
Variable COGS	120,000	Fixed and variable costs are listed in separate sections.
Other variable costs	30,000	
Total variable costs	150,000	Contribution margin is computed by taking sales minus variable costs.
Contribution margin	150,000	
Traceable fixed costs	90,000	
Division margin	\$ 60,000	Segment margin is Television's Contribution to profits.

Levels of Segmented Statements

Income Statement			
	Company	Television	Computer
Sales	\$ 500,000	\$ 300,000	\$ 200,000
Variable costs	230,000	150,000	80,000
CM	270,000	150,000	120,000
Traceable FC	170,000	90,000	80,000
Division margin	100,000	\$ 60,000	\$ 40,000
Common costs			
Net operating income			

Common costs should not be allocated to the divisions. These costs would remain even if one of the divisions were eliminated.

Traceable Costs Can Become Common Costs

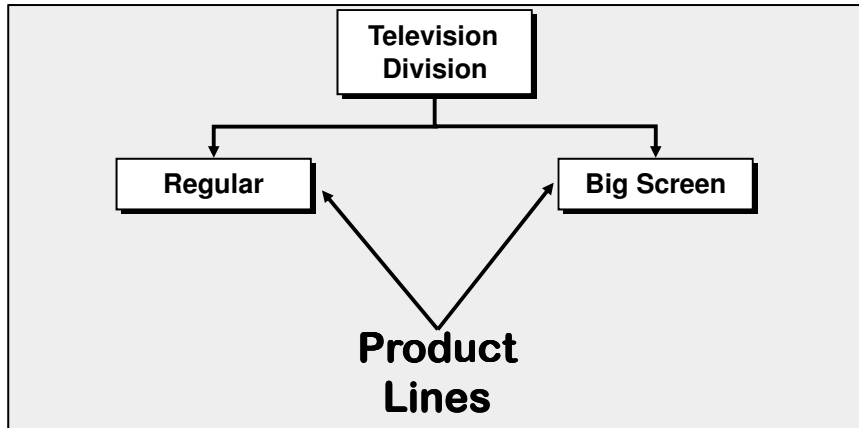
As previously mentioned, fixed costs that are traceable to one segment can become common if the company is divided into smaller segments.

Let's see how this works using the Webber, Inc. example!



Traceable Costs Can Become Common Costs

Webber's Television Division



Traceable Costs Can Become Common Costs

Income Statement			
	Television		
	Division	Regular	Big Screen
Sales		\$ 200,000	\$ 100,000
Variable costs		95,000	55,000
CM		105,000	45,000
Traceable FC		45,000	35,000
Product line margin		<u>\$ 60,000</u>	<u>\$ 10,000</u>
Common costs			
Divisional margin			

Of the \$90,000 of fixed costs that were previously traceable to the Television Division, only \$80,000 is traceable to the two product lines and \$10,000 is a common cost.

Segmented Income Statements and Decision Making

5% increase in sales

Income Statement			
	Television		
	Division	Regular	Big Screen
Sales	\$ 315,000	\$ 210,000	\$ 105,000
Variable costs	157,500	99,750	57,750
CM	157,500	110,250	47,250
Traceable FC	80,000	45,000	35,000
Product line margin	77,500	<u>\$ 65,250</u>	<u>\$ 12,250</u>
Common costs	15,000		
Divisional margin	<u>\$ 62,500</u>		

\$5,000 additional advertising

Division margin increases by \$2,500

Margin increases by \$5,250

Margin increases by \$2,250

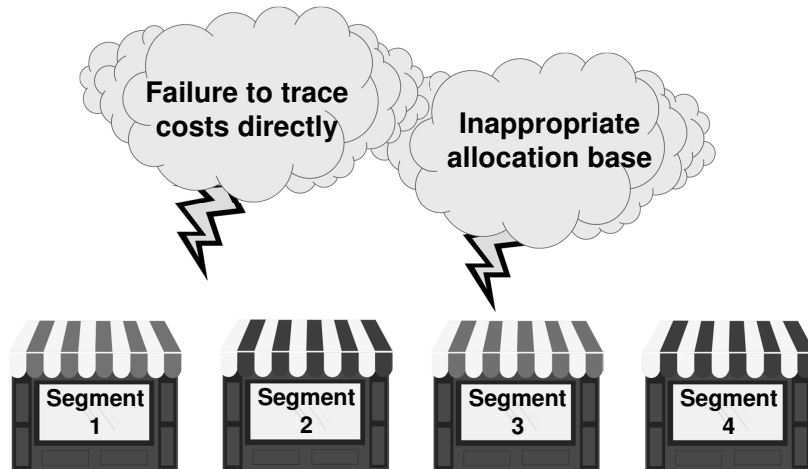
Omission of Costs

Costs assigned to a segment should include all costs attributable to that segment from the company's entire value chain.

Business Functions Making Up The Value Chain

R&D	Product Design	Manufacturing	Marketing	Distribution	Customer Service
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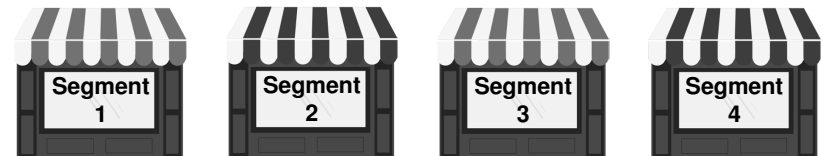
Inappropriate Methods of Allocating Costs Among Segments



Common Costs and Segments

Common costs should not be arbitrarily allocated to segments based on the rationale that “someone has to cover the common costs” for two reasons:

1. This practice may make a profitable business segment appear to be unprofitable.
2. Allocating common fixed costs forces managers to be held accountable for costs they cannot control.



Allocations of Common Costs

Income Statement			
	Hoagland's Lakeshore	Bar	Restaurant
Sales	\$ 800,000	\$ 100,000	\$ 700,000
Variable costs	310,000	60,000	250,000
CM	490,000	40,000	450,000
Traceable FC	246,000	26,000	220,000
Segment margin	244,000	14,000	230,000
Common costs	200,000	20,000	180,000
Profit	\$ 44,000	\$ (6,000)	\$ 50,000



Hurray, now everything adds up!!!

Companywide Income Statements



Both U.S. GAAP and IFRS require absorption costing for external reports.

Since absorption costing is required for external reporting, most companies also use it for internal reports rather than incurring the additional cost of maintaining a separate variable cost system for internal reporting.

Variable versus Absorption Costing

Fixed manufacturing costs must be assigned to products to properly match revenues and costs.



Absorption Costing

Fixed manufacturing costs are capacity costs and will be incurred even if nothing is produced.



Variable Costing

Segmented Financial Information



Both U.S. GAAP and IFRS require publically traded companies to include segmented financial data in their annual reports.

- 1. Companies must report segmented results to shareholders using the same methods that are used for internal segmented reports.**
- 2. This requirement motivates managers to avoid using the contribution approach for internal reporting purposes because if they did they would be required to:**
 - a. Share this sensitive data with the public.**
 - b. Reconcile these reports with applicable rules for consolidated reporting purposes.**

End of Chapter 6

