Learning Objective 4

Show the effects on contribution margin of changes in variable costs, fixed costs, selling price, and volume.

The Variable Expense Ratio

The variable expense ratio is the ratio of variable expenses to sales. It can be computed by dividing the total variable expenses by the total sales, or in a single product analysis, it can be computed by dividing the variable expenses per unit by the unit selling price.

Racing Bicycle Company Contribution Income Statement For the Month of June	Total	Per Unit	CM Ratio
Sales (500 bicycles)	$ 250,000	$ 500	100%
Less: Variable expenses	150,000	300	60%
Contribution margin	100,000	$ 200	40%
Less: Fixed expenses	80,000		
Net operating income	$ 20,000		

Changes in Fixed Costs and Sales Volume

What is the "profit impact" if Racing Bicycle can increase unit sales from 500 to 540 by increasing the monthly advertising budget by $10,000?

Changes in Fixed Costs and Sales Volume

$80,000 + $10,000 advertising = $90,000

	500 units	540 units
Sales	$ 250,000	$ 270,000
Less: Variable expenses	150,000	162,000
Contribution margin	100,000	108,000
Less: Fixed expenses	80,000	90,000
Net operating income	$ 20,000	$ 18,000

Sales *increased* by $20,000, but net operating income *decreased* by $2,000.

Changes in Fixed Costs and Sales Volume

A shortcut solution using "incremental" analysis

Increase in CM (40 units X $200)	$ 8,000
Increase in advertising expenses	10,000
Decrease in net operating income	$ (2,000)

Change in Variable Costs and Sales Volume

What is the "profit impact" if Racing Bicycle can use higher quality raw "materials", thus increasing variable costs per unit by $10, to generate an increase in unit sales from 500 to 580?

Change in Variable Costs and Sales Volume

580 units x $310 variable cost/unit = $179,800

	500 units	580 units
Sales	$ 250,000	$ 290,000
Less: Variable expenses	150,000	179,800
Contribution margin	100,000	110,200
Less: Fixed expenses	80,000	80,000
Net operating income	$ 20,000	$ 30,200

Sales *increase* by $40,000, and net operating income *increases* by $10,200.

Change in Fixed Cost, Sales Price and Volume

What is the profit impact if RBC: (1) cuts its selling price by $20 per unit, (2) increases its advertising budget by $15,000 per month, and (3) increases sales from 500 to 650 units per month?

Change in Fixed Cost, Sales Price and Volume

650 units x $480 = $312,000

	500 units	650 units
Sales	$ 250,000	$ 312,000
Less: Variable expenses	150,000	195,000
Contribution margin	100,000	117,000
Less: Fixed expenses	80,000	95,000
Net operating income	$ 20,000	$ 22,000

Sales *increase* by $62,000, fixed costs increase by $15,000, and net operating income *increases* by $2,000.

Change in Variable Cost, Fixed Cost and Sales Volume

What is the "profit impact" if RBC: (1) pays a $15 sales commission per bike sold instead of paying salespersons flat salaries that currently total $6,000 per month, and (2) increases unit sales from 500 to 575 bikes?

Change in Variable Cost, Fixed Cost and Sales Volume

575 units x $315 = $181,125

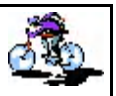
	500 units	575 units
Sales	$ 250,000	$ 287,500
Less: Variable expenses	150,000	181,125
Contribution margin	100,000	106,375
Less: Fixed expenses	80,000	74,000
Net operating income	$ 20,000	$ 32,375

"Sales *increase* by $37,500, fixed expenses *decrease* by $6,000. Net operating income *increases* by $12,375."

Change in Regular Sales Price

If RBC has an opportunity to sell 150 bikes to a wholesaler without disturbing sales to other customers or fixed expenses, what price would it quote to the wholesaler if it wants to increase monthly profits by $3,000?

Change in Regular Sales Price



$ 3,000 ÷ 150 bikes	=	$ 20	per bike
Variable cost per bike	=	300	per bike
Selling price required	=	$ 320	per bike

150 bikes × $320 per bike	=	$ 48,000
Total variable costs	=	45,000
Increase in net operating income	=	$ 3,000