

Recap 1-7

1. When expressed on a per unit basis, fixed costs can mislead decision makers into thinking of them as variable costs.

- A. True
- B. False

2. For a given level of sales, a low contribution margin ratio will produce more net operating income than a high contribution margin ratio.

- A. True
- B. False

3. Break-even analysis assumes that:

- A. Total revenue is constant.
- B. Unit variable expense is constant.
- C. Unit fixed expense is constant.
- D. Selling prices must fall in order to generate more revenue.

1. When expressed on a per unit basis, fixed costs can mislead decision makers into thinking of them as variable costs.

- A. True
- B. False

2. For a given level of sales, a low contribution margin ratio will produce more net operating income than a high contribution margin ratio.

- A. True
- B. False

3. Break-even analysis assumes that:

- A. Total revenue is constant.
- B. Unit variable expense is constant.
- C. Unit fixed expense is constant.
- D. Selling prices must fall in order to generate more revenue.

Rustafson corporation is a diversified manufacturer of consumer goods. The company's activity-based costing system has the following seven activity cost pools:

Activity Cost Pool	Estimated Overhead Cost	Expected Activity
Labor-related . . . . .	\$52,000	8,000 direct labor-hours
Machine-related. . . . .	\$15,000	20,000 machine-hours
Machine setups . . . . .	\$42,000	1,000 setups
Production orders . . . . .	\$18,000	500 orders
Product testing. . . . .	\$48,000	2,000 tests
Packaging . . . . .	\$75,000	5,000 packages
General factory . . . . .	\$108,800	8,000 direct labor-hours

**Required:**

1. Compute the activity rate for each activity pool;
2. Compute the company's predetermined overhead rate, assuming that the company uses a single plantwide predetermined overhead rate based on direct labor-hours.
3. What are the limits of using a plantwide approach for defining the POH rate? (answer in max. 3 lines)

1. The activity rates are computed as follows:

Activity Cost Pool	(a) Estimated Overhead Cost	(b) Expected Activity	(a) ÷ (b) Activity Rate
Labor related	\$ 52,000	8,000 DLHs	\$ 6.50 per DLH
Machine related	15,000	20,000 MHs	0.75 per MH
Machine setups	42,000	1,000 setups	42.00 per setup
Production orders	18,000	500 orders	36.00 per order
Product testing	48,000	2,000 tests	24.00 per test
Packaging	75,000	5,000 packages	15.00 per package
General factory	<u>108,800</u>	8,000 DLHs	13.60 per DLH
Total	<u>\$358,800</u>		

2. The predetermined overhead rate based entirely on direct labor-hours would be computed as follows:

Total estimated overhead cost (a)	\$358,800	
Total expected direct labor-hours (b)	<u>8,000</u>	DLHs
Predetermined overhead rate (a) ÷ (b)	<u>\$ 44.85</u>	per DLH

Larner Corporation is a diversified manufacturer of industrial goods. The company's activity-based costing system contains the following six activity cost pools and activity rates:

Activity Cost Pool	Activity Rates
Labor-related . . . . .	\$7.00 per direct labor-hour
Machine-related . . . . .	\$3.00 per machine-hour
Machine setups . . . . .	\$40.00 per setup
Production orders . . . . .	\$160.00 per order
Shipments . . . . .	\$120.00 per shipment
General factory . . . . .	\$4.00 per direct labor-hour

Cost and activity data have been supplied by the following products:

	J78	B52
Direct materials cost per unit . . . . .	\$6.50	\$31.00
Direct labor cost per unit . . . . .	\$3.75	\$6.00
Number of units produced per year . . . .	4,000	100

	Total Expected Activity	
	J78	B52
Direct labor-hours . . . . .	1,000	40
Machine-hours . . . . .	3,200	30
Machine setups . . . . .	5	1
Production orders . . . . .	5	1
Shipments . . . . .	10	1

**Required:** Compute the unit product cost of each product listed above

The unit product costs for the products are a combination of direct materials, direct labor, and overhead costs. The overhead costs assigned to each product would be computed as follows:

	J78		B52	
	Expected Activity	Amount	Expected Activity	Amount
Labor related, at \$7.00 per direct labor-hour	1,000	\$ 7,000	40	\$ 280
Machine related, at \$3.00 per machine-hour	3,200	9,600	30	90
Machine setups, at \$40.00 per setup	5	200	1	40
Production orders, at \$160.00 per order	5	800	1	160
Shipments, at \$120.00 per shipment	10	1,200	1	120
General factory, at \$4.00 per direct labor-hour	1,000	<u>4,000</u>	40	<u>160</u>
<b>Total overhead cost assigned (a)</b>		<b>\$22,800</b>		<b>\$ 850</b>
Number of units produced (b)		<u>4,000</u>		<u>100</u>
<b>Overhead cost per unit (a) ÷ (b)</b>		<b><u>\$ 5.70</u></b>		<b><u>\$8.50</u></b>

The unit product costs combine direct materials, direct labor, and overhead costs as follows:

	J78	B52
Direct materials	\$ 6.50	\$31.00
Direct labor	3.75	6.00
Manufacturing overhead (see above)	<u>5.70</u>	<u>8.50</u>
Unit product cost	<b><u>\$15.95</u></b>	<b><u>\$45.50</u></b>

Angie Silva has recently opened The Sandal Shop in Brisbane, Australia, a store that specializes in fashionable sandals. In time, she hopes to open a chain of sandal shops. As a first step, she has gathered the following data for her new store:

Sales price per pair of sandals .....	\$40
Variable expenses per pair of sandals .....	<u>16</u>
Contribution margin per pair of sandals .....	<u>\$24</u>
Fixed expenses per year:	
Building rental .....	\$15,000
Equipment depreciation .....	7,000
Selling .....	20,000
Administrative .....	<u>18,000</u>
Total fixed expenses .....	<u>\$60,000</u>

**Required:**

1. What is the break even point in unit sales and dollar sales?
2. Prepare a CVP graph or a profit graph for the store from zero pairs up to 4000 pairs of sandals sold each year. Indicate the break even point on your graph.
3. Angie has decided that she must earn a profit of \$18,000 the first year to justify her time and effort. How many pairs of sandals must be sold to attain this target profit?
4. Angie has now 2 salespersons working in the store – one full time and one part time. It will cost her an additional \$8,000 per year to convert the part-time position to a full time position. Angie believes that the change would increase annual sales by \$25,000. Should she convert the position?



5. Refer to the original data. During the first year, the store sold only 3,000 pairs of sandals and reported the following operating results. What is the degree of operating leverage? Using the degree of operating leverage, what would be the expected percentage increase in NOI if sales increase by 50%?

Sales (3,000 pairs) . . . . .	\$120,000
Variable expenses . . . . .	<u>48,000</u>
Contribution margin . . . . .	72,000
Fixed expenses . . . . .	<u>60,000</u>
Net operating income . . . . .	<u><u>\$ 12,000</u></u>

1. What is the break even point in unit sales and dollar sales?

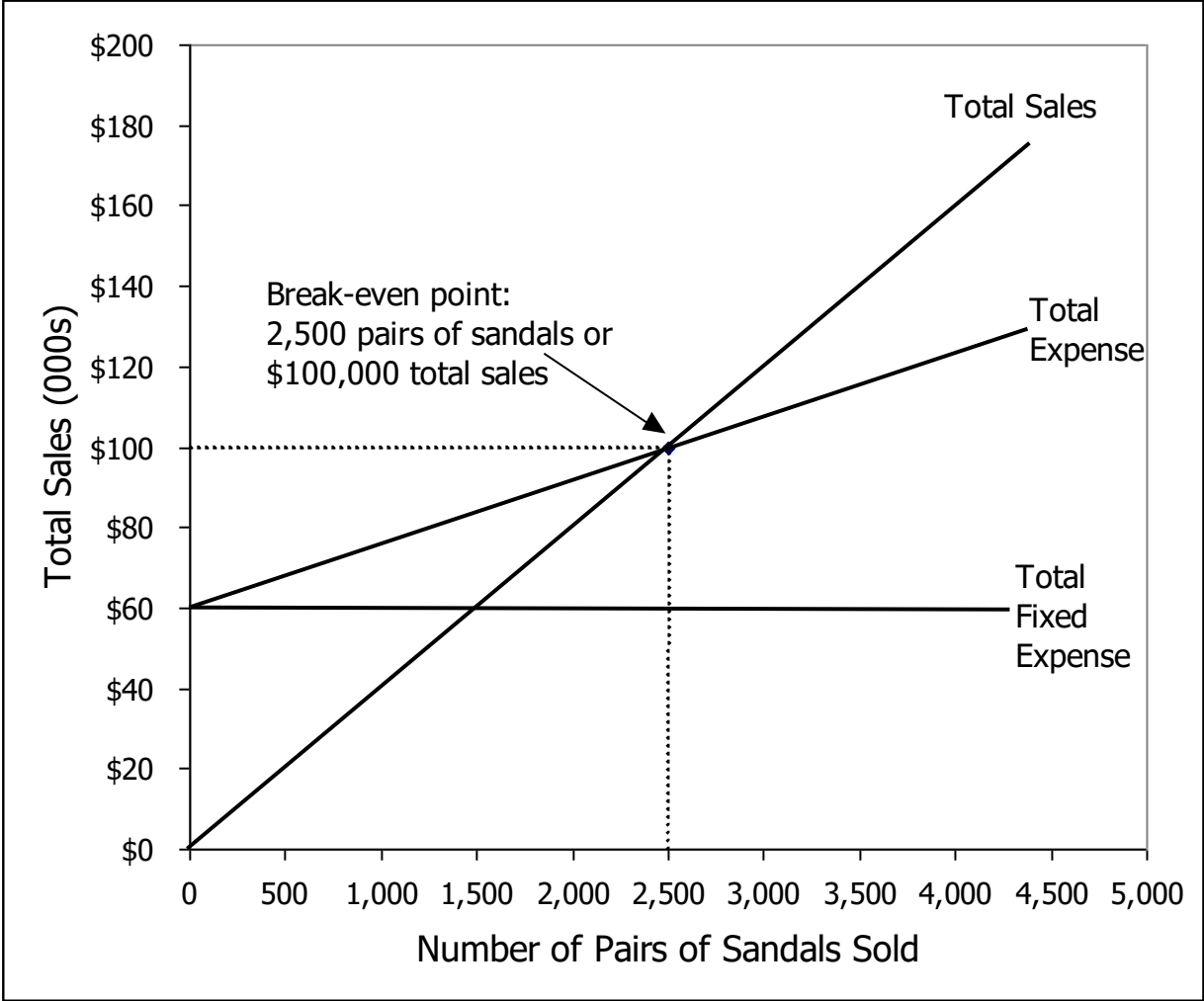
1.	Profit = Unit CM × Q – Fixed expenses
	\$0 = (\$40 – \$16) × Q – \$60,000
	\$0 = (\$24) × Q – \$60,000
	\$24Q = \$60,000
	Q = \$60,000 ÷ \$24
	Q = 2,500 pairs, or at \$40 per pair, \$100,000 in sales

Alternative solution:

$$\text{Unit sales to break even} = \frac{\text{Fixed expenses}}{\text{CM per unit}} = \frac{\$60,000}{\$24.00} = 2,500 \text{ pairs}$$

$$\text{Dollar sales to break even} = \frac{\text{Fixed expenses}}{\text{CM ratio}} = \frac{\$60,000}{0.60} = \$100,000$$

# 2. Cost-volume-profit graph:



3. Angie has decided that she must earn a profit of \$18,000 the first year to justify her time and effort. How many pairs of sandals must be sold to attain this target profit?

3.	Profit = Unit CM × Q – Fixed expenses
	\$18,000 = \$24 × Q – \$60,000
	\$24Q = \$18,000 + \$60,000
	Q = \$78,000 ÷ \$24
	Q = 3,250 pairs

Alternative solution:

$$\begin{aligned} \text{Unit sales to attain} &= \frac{\text{Target profit} + \text{Fixed expenses}}{\text{Unit contribution margin}} \\ \text{target profit} &= \frac{\$18,000 + \$60,000}{\$24.00} = 3,250 \text{ pairs} \end{aligned}$$

4. Angie has now 2 salespersons working in the store – one full time and one part time. It will cost her an additional \$8,000 per year to convert the part-time position to a full time position. Angie believes that the change would increase annual sales by \$25,000. Should she convert the position?

4.		
	Incremental contribution margin: \$25,000 increased sales × 60% CM ratio	\$15,000
	Incremental fixed salary cost	<u>8,000</u>
	Increased net income	<u>\$ 7,000</u>

Yes, the position should be converted to a full-time basis.

5. Refer to the original data. During the first year, the store sold only 3,000 pairs of sandals and reported the following operating results. What is the degree of operating leverage? Using the degree of operating leverage, what would be the expected percentage increase in NOI if sales increase by 50%?

$$\text{Degree of operating leverage} = \frac{\text{Contribution margin}}{\text{Net operating income}} = \frac{\$72,000}{\$12,000} = 6$$

b.  $6 \times 50\%$  sales increase = 300% *increase* in net operating income. Thus, net operating income next year would be:  $\$12,000 + (\$12,000 \times 300\%) = \$48,000$ .