

# RESPONSIBILITY AND SEGMENT ACCOUNTING

## Key Topics to Know

- Distinguish between centralized and decentralized organizations
- Responsibility accounting
- Distinguish between cost centers, profit centers and investment centers
- Distinguish between traceable and common fixed costs
- Segment income statements
  - Presentation of traceable and common fixed costs
  - Similarity to multi-product breakeven analysis in Chapter 5
  - Advantages of segment income statements
  - Use of segment margin in performance evaluation
- Return on Investment (ROI) calculations

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$$\text{ROI} = \frac{\text{Net operating income}}{\text{Average operating assets}}$$

OR

$$\text{ROI} = \text{Margin} \times \text{Turnover}$$

OR

$$\text{ROI} = \frac{\text{Net operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average operating assets}}$$

- How to improve ROI
- Residual Income calculations
  - Residual Income is income in excess of actual operating income over the minimum required income earned on average operating assets:

$$\begin{aligned} & \text{Average operating assets} \\ & \times \text{Required rate of return} \\ & = \text{Minimum required operating income} \\ & - \text{Actual operating income} \\ & = \text{Residual income} \end{aligned}$$

- Strengths and weaknesses of ROI and residual income as performance measures.

- **Balanced scorecard**
  - Set of multiple performance measures designed for continuous improvement of all key aspects of the business.
  - Divided into four areas: Innovation and learning, financial performance, internal processes and customer service
- **Transfer Pricing**
  - The price at which intra-company transactions are recorded
  - Three approaches:
    - Market Price
    - Negotiated Price
    - Cost

## Problems

### **Problem #1**

F Company supplied following data are for the latest year of operations:

Sales	\$24,480,000
Operating income	1,738,080
Average operating assets	6,000,000
Required rate of return	16%

- Required:
- a) What is the division's return on investment (ROI)?
  - b) What is the division's residual income?

### **Problem #2**

W Company's electronics division provided the following data are for the latest year of operations:

Sales	\$14,720,000
Operating income	1,000,960
Average operating assets	4,000,000
Required rate of return	14%

- Required:
- a) What is the division's profit margin?
  - b) What is the division's turnover?
  - c) What is the division's ROI?
  - d) What is the division's residual income?

### **Problem #3**

For last year, one division of the N Company reported operating assets of \$5,000,000 and operating income of \$750,000. N Company has established a target return on investment (ROI) of 14% for the division.

- Required:
- a) Calculate the division's ROI for the year. Did it achieve the target?
  - b) Assuming that operating assets for the next year increase by 10%. How much would operating income have to increase to reach the target?

**Problem #4**

P Company provided the following selected information about its consumer products division for the year:

Residual income	\$25,000
Operating income	230,000
Desired rate on investment	14%

Required: Based on this information, calculate the company's investment amount.

**Problem #5**

S Company reported the following information for the year:

Sales	\$880,000
Operating income	90,000
Average operating assets	475,000
Required rate of return	10%

Required: Based on this information, calculate the company's residual income for the year.

**Problem #6**

R Company's two operating divisions provided the following partial income statements for last year.

	<u>Division A</u>	<u>Division B</u>	<u>R Company</u>
Revenue	\$4,650,000		\$10,450,000
Operating Expenses		2,750,000	
Service department charges	<u>340,000</u>	<u>290,000</u>	
Operating Income			\$1,150,000

Required: Determine the missing amounts

## Multiple Choice Questions

1. In an income statement segmented by product line, a fixed expense that cannot be allocated among product lines on a cause and effect basis should be:
  - a) Classified as a traceable fixed expense and not allocated.
  - b) Allocated to product lines on the basis of sales dollars
  - c) Allocated to product lines on the basis of segment margin
  - d) Classified as a common fixed expense and not allocated.
  
2. A common cost that should not be assigned to a particular product on a segment income statement is:
  - a) Product advertising costs.
  - b) Salary of the corporate president.
  - c) Direct materials costs.
  - d) Product manager's salary.
  
3. Segment or division margin is sales less:
  - a) Variable expenses.
  - b) Traceable fixed expenses.
  - c) Variable and common fixed expenses.
  - d) Variable and traceable fixed expenses.
  
4. Data for June for the O Company and its two major business segments, North and South appear below:

	North	South
Revenues	\$550,000	\$110,000
Variable expenses	270,000	47,000
Traceable fixed expenses	88,000	21,000

In addition, common fixed expenses totaled \$145,000 and were allocated as follows: North - \$73,000 and South - \$72,000.

The segment income statement in the contribution format for North would show a segment margin of:

- a) \$270,000
- b) \$119,000
- c) \$207,000
- d) \$192,000

5. M Company has two sales areas: North and South. During April, the contribution margin in the North was \$90,000, or 30% of sales. The segment margin in the South was \$25,000, or 10% of sales. Traceable fixed expenses were \$30,000 in the North and \$15,000 in the South. Total net operating income was \$52,000. The variable costs for the South area were:
- \$180,000
  - \$210,000
  - \$225,000
  - \$120,000

6. S Company has two divisions: Domestic Division and Foreign Division. The following data are for the most recent operating period:

	<u>Domestic Division</u>	<u>Foreign Division</u>
Sales	\$300,000	\$261,000
Variable expenses	\$129,000	\$83,520
Traceable fixed expenses	\$102,000	\$109,000
Common fixed expense	\$42,000	\$36,540

The common fixed expenses have been allocated to the divisions on the basis of sales. The profit margin for the Domestic Division was:

- 57%
  - 23%
  - 9%
  - 48%
7. Residual income is:
- The same as operating income
  - The excess of operating income over the minimum operating income required
  - The excess of the minimum operating income required over operating income on the income statement
  - Operating income multiplied by the desired ROI
8. Which of the following is **not** a perspective used by the balanced scorecard?
- Financial
  - Customer
  - Short-term
  - Learning and growth

9. Which of the following is a perspective used by the balanced scorecard?
- Net income
  - Customer satisfaction
  - Internal business processes
  - Market share
10. Increasing sales increases ROI because
- Increases in sales translate into increases in operating income
  - Increases in sales improves margin
  - Increases in sales improves turnover
  - All of the above
11. Operating assets includes
- All assets
  - Only fixed assets
  - Only assets used in generating income
  - Only current assets
12. Residual income and ROI:
- Often give conflicting recommendations
  - Always recommend the same projects
  - Are used for different types of decision making
  - Are both expressed in dollars
13. Which of the following is a advantage of decentralization?
- Fosters competition among divisions
  - Managers do not share specialized knowledge
  - Optimal utilization of resources
  - Allows top managers to focus on division-level issues
14. The responsibility center in which the manager has responsibility and authority over only revenues and costs is
- A cost center
  - A profit center
  - An investment center
  - A revenue center

15. Which of the following statements follows from the concept of controllability?
- a) A profit center manager should be evaluated based on division or segment margin, not profit margin.
  - b) An investment center manager should be evaluated based on return on investment, not residual income.
  - c) A profit center manager should be evaluated based on residual income, not return on investment.
  - d) A cost center manager should be evaluated on costs and revenues, not just costs.
16. F Company has revenues of \$1,500,000 resulting in an operating income of \$105,000. Average invested assets total \$750,000; the cost of capital is 10%. Return on investment is
- a) 7%
  - b) 14%
  - c) 10%
  - d) 60%
17. A Company has an operating income of \$80,000 on revenues of \$1,000,000. Average invested assets are \$500,000 and A Company has an 6% cost of capital. What is the profit margin?
- a) 8%
  - b) 10%
  - c) 6%
  - d) 16%
18. Which of the following is **not** an advantage of decentralization?
- a) Allows top managers to focus on strategic issues
  - b) Potential duplication of resources
  - c) Allows for development of managerial expertise
  - d) Managers can react quickly to local information



## Solutions to Problems

### **Problem #1**

a)

<u>Operating Income</u>		ROI
Operating assets =		
<u>\$1,738,080</u>		28.97%
\$6,000,000 =		

b)

Operating assets	\$6,000,000
Desired rate of return	<u>14%</u>
Target operating income	\$840,000
Actual operating income	<u>\$1,738,080</u>
Residual income	\$778,080

### **Problem #2**

a)

<u>Operating Income</u>		Margin
Sales =		
<u>\$1,000,960</u>		6.8%
\$14,720,000 =		

b)

<u>Sales</u>		Turnover
Operating assets =		
<u>\$14,720,000</u>		3.68
\$4,000,000 =		

c)

<u>Operating Income</u>		ROI
Operating assets =		
<u>\$1,000,960</u>		25.02%
\$4,000,000 =		

d)		
	Operating assets	\$4,000,000
	Desired rate of return	<u>14%</u>
	Target operating income	\$560,000
	Actual operating income	<u>\$1,000,960</u>
	Residual income	\$440,960

**Problem #3**

a)		
	<u>Operating Income</u>	
	Operating assets =	ROI
	<u>\$750,000</u>	15%
	\$5,000,000 =	

Yes, the division exceeded the company target.

b)		
	Operating assets \$5,000,000 + 10%	\$5,500,000
	Desired rate of return	<u>14%</u>
	Target operating income	\$770,000
	Actual operating income	<u>750,000</u>
	Increase required	\$20,000

**Problem #4**

	<u>Operating Income - Residual income</u>	
	Desired ROI =	Investment
	<u>\$235,000 - \$25,000</u>	\$1,464,286
	14% =	

**Problem #5**

	Average operating assets x	
Net income -	Desired ROI =	Residual income
\$90,000 -	\$475,000 x 10% =	\$42,500

**Problem #6**

	<u>Division A</u>	<u>Division B</u>	<u>R Company</u>
Revenue	\$4,650,000	<b>\$5,800,000</b>	\$10,450,000
Operating Expenses	<b>5,920,000</b>	2,750,000	<b>8,670,000</b>
Service department charges	<u>340,000</u>	<u>290,000</u>	<b>630,000</b>
Operating Income	<b>(\$1,610,000)</b>	<b>\$2,760,000</b>	\$1,150,000

## Solutions to Multiple Choice Questions

- |     |   |
|-----|---|
| 1.  | D |
| 2.  | B |
| 3.  | D |
| 4.  | D |
| 5.  | B |
| 6.  | B |
| 7.  | B |
| 8.  | C |
| 9.  | C |
| 10. | A |
| 11. | C |
| 12. | A |
| 13. | A |
| 14. | B |
| 15. | A |
| 16. | B |
| 17. | A |
| 18. | B |