

# Capítulo 13 Performance Measurement on Decentralized Organizations

## Exercise 10-1 (10 minutes)

1. 
$$\text{Margin} = \frac{\text{Net operating income}}{\text{Sales}}$$

$$= \frac{\$600,000}{\$7,500,000} = 8\%$$
  
2. 
$$\text{Turnover} = \frac{\text{Sales}}{\text{Average operating assets}}$$

$$= \frac{\$7,500,000}{\$5,000,000} = 1.5$$
  
3. 
$$\text{ROI} = \text{Margin} \times \text{Turnover}$$

$$= 8\% \times 1.5 = 12\%$$

## Exercise 10-2 (10 minutes)

Average operating assets .....	<u>\$2,800,000</u>
Net operating income .....	\$ 600,000
Minimum required return:	
18% × \$2,800,000 .....	<u>504,000</u>
Residual income .....	<u>\$ 96,000</u>

## Exercise 10-5 (15 minutes)

	<i>Division</i>		
	<i>Alpha</i>	<i>Bravo</i>	<i>Charlie</i>
Sales (a) .....	\$4,000,000	\$11,500,000 *	\$3,000,000
Net operating income (b) .....	\$160,000	\$920,000 *	\$210,000 *
Average operating assets (c) .....	\$800,000 *	\$4,600,000	\$1,500,000

Margin (b) ÷ (a).....	4%*	8%	7%*
Turnover (a) ÷ (c).....	5*	2.5	2
Return on investment (ROI).....	20%	20%*	14%*

Note that Divisions Alpha and Bravo apparently have different strategies to obtain the same 20% return. Division Alpha has a low margin and a high turnover, whereas Division Bravo has just the opposite.

\*Given.

**Exercise 10-6** (20 minutes)

1. ROI computations:

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

Osaka Division:

$$\text{ROI} = \frac{\$210,000}{\$3,000,000} \times \frac{\$3,000,000}{\$1,000,000} = 7\% \times 3 = 21\%$$

Yokohama Division:

$$\text{ROI} = \frac{\$720,000}{\$9,000,000} \times \frac{\$9,000,000}{\$4,000,000} = 8\% \times 2.25 = 18\%$$

2.		<i>Osaka</i>	<i>Yokohama</i>
Average operating assets (a).....		<u>\$1,000,000</u>	<u>\$4,000,000</u>
Net operating income .....		\$210,000	\$720,000
Minimum required return on average operating assets:			
15% × (a) .....		<u>150,000</u>	<u>600,000</u>
Residual income .....		<u>\$ 60,000</u>	<u>\$120,000</u>

3. No, the Yokohama Division is simply larger than the Osaka Division and for this reason one would expect that it would have a greater amount of residual income. Residual income can't be used to compare the performance of divisions of different sizes. Larger divisions will almost always look better. In fact, in the case above, the Yokohama Division does not appear to be as well managed as the Osaka Division. Note from Part (1) that Yokohama has only an 18% ROI as compared to 21% for Osaka.

**Problem 10-17** (30 minutes)

1. Breaking the ROI computation into two separate elements reveals important relationships that otherwise might remain hidden. First, the importance of asset turnover as a key element to overall profitability is emphasized. Prior to use of the ROI formula, managers tended to allow operating assets to swell to excessive levels. Second, the importance of sales volume in profit computations is explicitly recognized. Third, breaking the ROI computation into margin and turnover elements stresses the possibility of trading one off for the other in attempts to improve the overall profit picture. That is, a company may shave its margins slightly hoping for a large enough increase in turnover to increase the overall rate of return. Fourth, ratios make it easier to make comparisons between segments of the organization.
2. The missing information is as follows:

	<i>Companies in the Same Industry</i>		
	<i>A</i>	<i>B</i>	<i>C</i>
Sales (a) .....	\$600,000 *	\$500,000 *	\$2,000,000
Net operating income (b).....	\$84,000 *	\$70,000 *	\$70,000
Average operating assets (c).....	\$300,000 *	\$1,000,000	\$1,000,000 *
Margin (b) ÷ (a).....	14%	14%	3.5% *
Turnover (a) ÷ (c).....	2.0	0.5	2.0 *
Return on investment (ROI).....	28%	7% *	7%

\*Given.

*NAA Report No. 35* states (p. 35):

“Introducing sales to measure level of operations helps to disclose specific areas for more intensive investigation. Company B does as well as Company A in terms of profit margin, for both companies earn 14% on sales. But Company B has a much lower turnover of capital than does Company A. Whereas a dollar of investment in Company A supports two dollars in sales each period, a dollar investment in Company B supports only fifty cents in sales each period. This suggests that the analyst should look carefully at Company B’s investment. Is the company keeping an inventory larger than necessary for its sales volume? Are receivables being collected promptly? Or did Company A acquire its fixed assets at a price level which was much lower than that at which Company B purchased its plant?”

**Problem 10-17** (continued)

Thus, by including sales specifically in ROI computations the manager is able to discover possible problems, as well as reasons underlying a strong or a weak performance. Looking at Company A compared to Company C, notice that C's turnover is the same as A's, but C's margin on sales is much lower. Why would C have such a low margin? Is it due to inefficiency, is it due to geographical location (requiring higher salaries or transportation charges), is it due to excessive materials costs, or is it due to other factors? ROI computations raise questions such as these, which form the basis for managerial action.

To summarize, in order to bring B's ROI into line with A's, it seems obvious that B's management will have to concentrate its efforts on increasing turnover, either by increasing sales or by reducing assets. It seems unlikely that B can appreciably increase its ROI by improving its margin on sales. On the other hand, C's management should concentrate its efforts on the margin element by trying to pare down its operating expenses.