

ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENTS

I N T R O D U C T I O N

The first part of this chapter introduces the reader to the various groups of people who might be interested in analyzing a company's financial statements. However, the rest of the chapter concentrates on the basic analysis of financial statements, with the emphasis on balance sheet and the income statement.

Comparative financial statements present information for at least two successive time periods shown side by side. The dollar change and the percentage of change for each item of the financial statement are shown to include totals and subtotals. In essence, a **comparative horizontal analysis** infers that the use of at least two consecutive financial statements (balance sheets, incomes statements, etc.) are analyzed. A second approach to the analysis of financial statements,

called common-size, is where each item of the statement is converted to a percentage using a significant total. This indicates a vertical analysis is used to convert dollar values to percentages. The terms comparative horizontal analysis and **common-size vertical analysis** will be used to illustrate and discuss these methods in this chapter.

An additional method of income statement analysis that determines average check, average cost, average income per guest, and other revenue and cost averages will be illustrated and discussed. Another analysis method called **trend percentages** results when the difference in the dollar amount between two periods is divided by the dollar amount of the first period to find the percentage of change. These methods provided

additional useful information to management and will be illustrated and discussed.

The implications of price and cost level changes, inflation or deflation, on the operating results of a

business are covered in some detail. We will explore how to use a readily available index, or to compile an index for a specific business, and how to convert historic figures to current dollar amounts.

CHAPTER OBJECTIVES

After studying this chapter, the reader should be able to

- 1** Explain some of the aspects different readers of financial statements are interested in.
- 2** Describe comparative horizontal analysis and use it for balance sheet and income statement analysis.
- 3** Describe common size vertical analysis and use it for balance sheet and income statement analysis.
- 4** Calculate average sales, average costs, and average income per guest.
- 5** Calculate trend percentages.
- 6** Prepare a trend index.
- 7** Use index numbers to convert historic dollars to current dollars.

ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENTS

Analysis and interpretation of financial statements means looking at the various parts of the financial statements, relating the parts to each other and to the picture as a whole, and determining if any meaningful and useful interpretation can be made out of this analysis.

All readers of financial statements, managers, owners, investors, and creditors, are interested in analyzing and interpreting the financial statements. However, what is of interest to one may be of less interest to another. For example, managers are very concerned about the internal operating efficiency of the organization and will look for indications that things are running smoothly, that operating goals are being met, and that the various departments are being managed as profitably as possible. Stockholders, on the other hand, are more interested in the net income and about future earnings and dividend prospects. In many cases, they would not be concerned about or be familiar with internal departmental results.

Creditors and investors other than stockholders might be interested in the net income but are even more interested in the debt-paying ability of the company. A company might have good earnings but, because of a shortage of cash, might not be able to meet its debt obligations.

An exhaustive coverage of the analysis and interpretation of financial statements is beyond the scope of this text. Therefore, this discussion will be confined to some of the more fundamental analysis techniques that lend themselves well to the hospitality industry. Also, comment will be confined to the two major financial statements: the balance sheet and the income statement. The analysis techniques illustrated are those that normally would be used by the operation's management.

COMPARATIVE HORIZONTAL ANALYSIS OF BALANCE SHEETS

A basic set of financial statements includes a balance sheet at a specific date and an income statement for the accounting period ended on that date. Some sets of financial statements may include a balance sheet and income statement for both the previous and current accounting periods. When prior and current period statements are provided, changes occurring between the two consecutive years or periods can be seen. However, these changes might not be as obvious as you would expect. It is not easy to mentally compare the differences between two sets of figures, and it is extremely useful to have additional information available for analysis.

One method is to complete a **comparative horizontal analysis** of a balance sheet or an income statement. This technique requires at least two consecutive periods of information. The objective is to find and identify changes that have occurred over an accounting period. The difference in dollar value reported between the two statements for each line item, subtotal, or total of the statement is calculated and identified as a positive or negative dollar value change. The change, positive or negative, is divided by the prior period's dollar amount to determine the percentage change.

Completing comparative horizontal analysis of any item, subtotal, or total appearing in a financial statement is not the difficult part of a comparative analysis. The difficult part is understanding what the analysis is telling you. Exhibit 3.1 shows balance sheet information for two successive years, and the identity of each line item, subtotals, and totals for all assets, liabilities, and stockholders' equity is shown. In addition, two extra columns are added for comparative analysis, one to show the dollar value change and the other to express the percentage of change for each line item reported.

In Exhibit 3.1, the ending balance of the cash account in Year 0003 was \$22,900 and in Year 0004, the ending balance was \$35,400. The ending balance of prepaid expenses in Year 0003 was \$5,200 and the Year 0004 ending balance was \$4,900. We can see that the ending cash balance is \$12,500 positive or

	<i>Year 0003</i>	<i>Year 0004</i>	<i>Dollar Change</i>	<i>Percent Change</i>
ASSETS				
<i>Current Assets</i>				
Cash	\$ 22,900	\$ 35,400	+ \$12,500	+ 54.6%
Accounts receivable	23,100	25,200	+ 2,100	+ 9.1%
Marketable securities	15,000	2,000	- 13,000	- 86.7%
Inventories	19,900	24,700	+ 4,800	+ 24.1%
Prepaid expenses	5,200	4,900	- 300	- 5.8%
<i>Total Current Assets</i>	<u>\$ 86,100</u>	<u>\$ 92,200</u>	<u>+ \$ 6,100</u>	<u>+ 7.1%</u>
<i>Fixed Assets</i>				
Land	\$ 161,800	\$ 161,800	-0-	-0-
Building	1,432,800	1,432,800	-0-	-0-
Furniture and equipment	374,700	415,600	+ \$40,900	+ 10.9%
China, glass, etc.	25,600	28,400	+ 2,800	+ 10.9%
	<u>\$1,994,900</u>	<u>\$2,038,600</u>	<u>+ \$43,700</u>	<u>+ 2.2%</u>
Less: Accumulated depreciation	(632,200)	(722,000)	+ (89,800)	+ (14.2)%
<i>Total Fixed Assets</i>	<u>\$1,362,700</u>	<u>\$1,316,600</u>	<u>- \$46,100</u>	<u>- 3.4%</u>
<i>Total Assets</i>	<u>\$1,448,800</u>	<u>\$1,408,800</u>	<u>- \$40,000</u>	<u>- 2.8%</u>
LIABILITIES AND STOCKHOLDERS' EQUITY				
<i>Current liabilities</i>				
Accounts payable	\$ 19,200	\$ 26,500	+ \$ 7,300	+ 38.0%
Accrued expenses	3,500	4,100	+ 600	+ 17.1%
Income taxes payable	12,300	10,900	- 1,400	- 11.4%
Deposits and credit balances	500	1,800	+ 1,300	+ 260.0%
Current portion of mortgage	27,200	25,100	- 2,100	- 7.7%
<i>Total Current Liabilities</i>	<u>\$ 62,700</u>	<u>\$ 68,400</u>	<u>+ \$ 5,700</u>	<u>+ 9.1%</u>
<i>Long-term liability</i>				
Mortgage payable	<u>\$ 812,900</u>	<u>\$ 787,800</u>	<u>- \$25,100</u>	<u>- 3.1%</u>
<i>Stockholders' Equity</i>				
Common stock	\$ 300,000	\$ 300,000	-0-	-0-
Retained earnings	273,200	252,600	- \$20,600	- 7.5%
<i>Total Stockholders' Equity</i>	<u>\$ 573,200</u>	<u>\$ 552,600</u>	<u>- \$20,600</u>	<u>- 3.6%</u>
<i>Total Liabilities & Stockholders' Equity</i>	<u>\$1,448,800</u>	<u>\$1,408,800</u>	<u>- \$40,000</u>	<u>- 2.8%</u>

EXHIBIT 3.1

Comparative Horizontal Analysis Balance Sheets

higher than Year 0003, and the ending prepaid expense account is \$300 negative or lower than Year 0003. To calculate the dollar change and the percentage change, use the following equation:

$$\text{Period 2} - \text{Period 1} = \% \text{ Change} / \text{Period 1} = \text{Percentage Change}$$

The calculation for the cash account and the prepaid expense account are as follows:

Cash Account Analysis

Period 2 – Period 1 = \$ Change / Period 1 = Percentage Change

$$\$35,400 - \$22,900 = +\$12,500 / \$22,900 = +\underline{54.6\%}$$

Note: From a calculator, the answer will be a decimal. To state the answer as a percentage, multiply by 100 and round to one position right of decimal. The calculation $\$12,500 / \$22,900 = 0.54585 \times 100$ will show 54.585. Rounding to the first position right of the decimal, the product is 54.6 percent.

Prepaid Expense Account Analysis

Period 2 – Period 1 = \$ Change / Period 1 = Percentage Change

$$\$4,900 - \$5,200 = (-\$300) / \$5,200 = \underline{(-5.8\%)}$$

$$[(-\$300) / \$5,200 = (-0.0576) \times 100 = (-5.76) \text{ and read as } \underline{(-5.8\%)}]$$

The latter two columns are helpful in pinpointing large changes that have occurred, either dollar amount changes or percentage changes. As well, we are looking for percentage changes in one account that are not of the same magnitude as the percentage changes of the other accounts. In Exhibit 3.1, total current assets have increased by 7.1 percent and total assets have decreased by –2.8 percent. However, consider the cash account. The change from Year 0003 to Year 0004 is \$12,500. This may or may not be a large change depending on the size of the hotel. The change becomes obvious when expressed in percentage terms: 54.6 percent ($\$12,500 / \$22,900$). Why has the cash account increased by almost 55 percent in the past year? However, the marketable securities account has decreased \$13,000, or 86.7 percent. It appears that most of the securities held have been cashed in during the year. Is this conversion for a specific purpose? If not, perhaps we should use some of it to reduce accounts payable, which have gone up by \$7,300 (38 percent).

Notice also that the amount of money tied up in inventories has gone up by \$4,800. This may not be much in dollars, but it is an increase of 24.1 percent over the previous year. Has our volume of sales increased sufficiently to justify this increase in inventories? An analysis of change in inventory turnover rates might answer this question. (See Chapters 4 and 11 for a discussion of inventory turnover.)

Note that the deposits and credit balances account has gone up by 260 percent. Has there been a change in the policy concerning deposits required for future bookings or reservations, or is this change indicative of a big increase in guaranteed future business compared to a year ago?

In comparative analysis, the terms *absolute* and *relative change* are sometimes used. An absolute change shows the dollar change from one period to the next. A relative change is the absolute change expressed as a percentage.

An absolute change may sometimes appear large (for example, \$10,000) but when compared to its base figure (e.g., \$1,000,000) represents a relative change of only 1%. By the same token, a relative change may seem high (e.g., 50%) but when compared to its base figure is quite small in absolute terms (for example, a \$50 base figure increasing to \$75). In terms of the total income statement, this \$25 change (even though it shows a relative increase of 50%) is insignificant. Therefore, when analyzing comparative statements, both the absolute and the relative changes should be looked at, and only those that exceed both acceptable norms should be of concern.

For example, absolute changes of concern might be established at \$10,000 and relative changes at 5%, and only those changes that exceeded both \$10,000 and 5% would be investigated. In this situation, the following changes would not be investigated:

- Above \$10,000 but below 5 percent
- Above 5 percent but below \$10,000
- Below \$10,000 and below 5 percent

COMMON-SIZE VERTICAL ANALYSIS OF BALANCE SHEETS

Another technique used to analyze balance sheet information is to convert the statement to a common-size vertical analysis format. This method requires only one period of financial data. **Common size** means that total assets have a value of 100 percent and the numerical value of each item being converted represents a fractional part of total assets. Since $\text{Assets} = \text{Liabilities} + \text{Ownership Equity}$ and each side of the balance sheet has the same total value, every item in a balance sheet, subtotals, and totals, can be expressed as a percentage of total assets. Exhibit 3.2 shows the common-size (vertical) conversion of the comparative balance sheet shown in Exhibit 3.1. The common-size statement shows that the cash account in Year 0003 is 1.6 percent of total assets, which was calculated by dividing the cash balance by total assets; $\$22,900 / \$1,448,800$. Accounts payable in Year 0003 is 1.3 percent of total assets, $\$19,200 / \$1,448,800$. In Exhibit 3.2, each balance sheet item shown for Year 0003 is divided by total assets of Year 0003. The addition of each item percentage shown for Year 0003 will equal 100 percent, which is the product of total assets divided by total assets.

Any subset of a balance sheet such as current assets, fixed assets, current liabilities, long-term liabilities, or ownership equity can be converted to a common-size vertical format and analyzed separately. Since each current liability is a part of total current liabilities, a common-size vertical analysis of current liabilities will express each individual current liability as a percentage of total

	<i>Year Ending December 31</i>		<i>Common Size</i>	
	<i>0003</i>	<i>0004</i>	<i>0003</i>	<i>0004</i>
ASSETS				
<i>Current Assets</i>				
Cash	\$ 22,900	\$ 35,400	1.6%	2.5%
Accounts receivable	23,100	25,200	1.6%	1.8%
Marketable securities	15,000	2,000	1.0%	0.1%
Inventories	19,900	24,700	1.4%	1.8%
Prepaid expenses	5,200	4,900	0.4%	0.3%
<i>Total Current Assets</i>	<u>\$ 86,100</u>	<u>\$ 92,200</u>	<u>5.9%*</u>	<u>6.5%</u>
<i>Fixed Assets</i>				
Land	\$ 161,800	\$ 161,800	11.2%	11.5%
Building	1,432,800	1,432,800	98.9%	101.7%
Furniture and equipment	374,700	415,600	25.9%	29.5%
China, glass, etc.	25,600	28,400	1.8%	2.0%
	<u>\$1,994,900</u>	<u>\$2,038,600</u>	<u>137.8%</u>	<u>144.7%</u>
Less: Accumulated depreciation	(632,200)	(722,000)	(43.6)%	(51.2)%
<i>Total Fixed Assets</i>	<u>\$1,362,700</u>	<u>\$1,316,600</u>	<u>94.1%*</u>	<u>93.5%</u>
<i>Total Assets</i>	<u>\$1,448,800</u>	<u>\$1,408,800</u>	<u>100%</u>	<u>100%</u>
LIABILITIES AND STOCKHOLDERS' EQUITY				
<i>Current Liabilities</i>				
Accounts payable	\$ 19,200	\$ 26,500	1.3%	1.9%
Accrued expenses	3,500	4,100	0.2%	0.3%
Income taxes payable	12,300	10,900	0.8%	0.8%
Deposits and credit balances	500	1,800	0.0%	0.1%
Current portion of mortgage	27,200	25,100	1.9%	1.8%
<i>Total Current Liabilities</i>	<u>\$ 62,700</u>	<u>\$ 68,400</u>	<u>4.3%*</u>	<u>4.9%</u>
<i>Long-term Liability</i>				
Mortgage payable	<u>\$ 812,900</u>	<u>\$ 787,800</u>	<u>56.1%</u>	<u>55.9%</u>
<i>Stockholders' Equity</i>				
Common stock	\$ 300,000	\$ 300,000	20.7%	21.3%
Retained earnings	273,200	252,600	18.9%	17.9%
<i>Total Stockholders' Equity</i>	<u>\$ 573,200</u>	<u>\$ 552,600</u>	<u>39.6%</u>	<u>39.2%</u>
<i>Total Liabilities & Stockholders' Equity</i>	<u>\$1,448,800</u>	<u>\$1,408,800</u>	<u>100%</u>	<u>100%</u>

*This does not add up due to rounding.

EXHIBIT 3.2

Common-Size Vertical Analysis Balance Sheets

current liabilities. As an example, we will use the current liability accounts in Exhibit 3.2 to express each as a percentage of total current liabilities.

$$\begin{aligned}
 &\text{Accounts payable} + \text{Accrued Expenses} + \text{Income taxes payable} \\
 &+ \text{Deposits and credit balances} + \text{Current portion of mortgage} \\
 &= \text{Current Liabilities} \\
 &\$19,200 = n_1 + \$3,500 = n_2 + \$12,300 = n_3 + \$500 \\
 &= n_4 + \$27,200 = n_5 = \underline{\underline{\$62,700}} = \sum n
 \end{aligned}$$

The common-size vertical analysis can be described using the equation: $n_1 + n_2 + n_3 + \cdots + n_x = \sum n$. Each element, n_1 , n_2 , and n_3 is divided by the sum, $\sum n$, to find its percentage relationship; $n_1 / \sum n$ identifies what percentage n_1 is of $\sum n$.

Thus,

$$\begin{aligned}
 [n_1 / \sum n] &= \$19,200 / \underline{\underline{\$62,700}} = 30.6 \text{ percent of current liabilities} \\
 [n_2 / \sum n] &= \$ 3,500 / \underline{\underline{\$62,700}} = 5.6 \text{ percent of current liabilities} \\
 [n_3 / \sum n] &= \$12,300 / \underline{\underline{\$62,700}} = 19.6 \text{ percent of current liabilities} \\
 [n_4 / \sum n] &= \$ 500 / \underline{\underline{\$62,700}} = 0.8 \text{ percent of current liabilities} \\
 [n_5 / \sum n] &= \$27,200 / \underline{\underline{\$62,700}} = 43.4 \text{ percent of current liabilities}
 \end{aligned}$$

Using the same five current liabilities, we can also use a math equation that might be more familiar: $X = \$62,700$ total current liabilities [$A + B + C + D + E = X$].

$$\begin{aligned}
 A / X &= \$19,200 / \underline{\underline{\$62,700}} = 30.6 \text{ percent} \\
 B / X &= \$ 3,500 / \underline{\underline{\$62,700}} = 5.6 \text{ percent} \\
 C / X &= \$12,300 / \underline{\underline{\$62,700}} = 19.6 \text{ percent} \\
 D / X &= \$ 500 / \underline{\underline{\$62,700}} = 0.8 \text{ percent} \\
 E / X &= \$27,200 / \underline{\underline{\$62,700}} = 43.4 \text{ percent}
 \end{aligned}$$

Regardless of whether you are converting a balance sheet or a subset of assets, liabilities, or ownership equity, the conversion procedure is the same.

The advantage of common-size statements is that they show changes in proportion of individual accounts from one period to the next. For example, the cash account in Year 0003 was 1.6 percent of total assets. In Year 0004, it was 2.5 percent of total assets. This change in proportion would normally attract a reader's attention and raise questions. Attention might also be drawn to other accounts where large changes have occurred. The common-size vertical analysis technique is particularly useful when comparing two companies whose size

and/or level of business are very different so other techniques of analysis are not appropriate.

Whether a hotel or food service operation uses comparative balance sheets or common-sized balance sheets is a matter of choice. Normally, only one or the other would be preferred since both draw the attention of the reader to the relevant accounts where changes have occurred. However, sometimes one technique will identify changes that other techniques did not indicate. Identifying changes should provoke questions, the answers to which may be helpful in running the business more effectively. Attention should be focused on the balance sheet because of the need for effective control or management of a company's assets. However, as a management technique for controlling internal day-to-day operations, comparative income statements are often more useful than comparative balance sheets.

COMPARATIVE HORIZONTAL ANALYSIS OF INCOME STATEMENTS

Exhibit 3.3 shows two consecutive annual income statements for a food department of a hotel. The same method that was used to analyze balance sheets is used for income statements. Line by line, find the numerical value change and divide the change by the prior year to find the percentage of change. For example, revenue increased by 10.1 percent from Year 0003 to Year 0004. The calculation to identify the percentage of change is as follows:

$$\begin{aligned} (\text{Sales revenue 0004} - \text{Sales revenue 0003}) / \text{Sales Revenue 0003} &= \% \text{ Change} \\ (\$221,900 - \$201,600) / \$201,600 &= \% \text{ Change} \\ \$20,300 / \$201,600 &= \underline{\underline{10.1\%}} \end{aligned}$$

The comparative horizontal analysis follows the same procedures to calculate the numerical change of each line item and the percentage that change represents. It matters not what financial information is being compared, as long as two consecutive operating periods of information are provided. The concept remains:

$$(\text{Period 2} - \text{Period 1}) = \$ \text{ Change} / \text{Period 1} = \% \text{ Change}$$

The other percentage change figures are calculated in the same way. Note that within each revenue area, except banquets, the revenue has increased, but total revenue has gone up only 2.1 percent. The reason for this relatively small increase in total revenue is that banquet revenue was down 7.7 percent over the year. Can the reasons be determined? Is the sales department not doing an effective job? Is there a new, competitive operation close by? Are prices too high?

Even with the small total sales revenue increase, income has declined \$37,100, or 24.2 percent. This is a drastic change. With revenue up, all other factors being equal, income should also be up, not down.

Year Ending December 31		Increase or Decrease from Year 0003 to 0004	
	0003	0004	
			\$ Change % Change
<i>Revenue</i>			
Dining room	\$201,600	\$221,900	+ \$20,300 + 10.1%
Coffee shop	195,900	201,700	+ 5,800 + 3.0%
Banquets	261,200	241,100	- 20,100 - 7.7%
Room service	81,700	82,600	+ 900 + 1.1%
Bar	111,200	121,800	+ 10,600 + 9.5%
<i>Total sales revenue</i>	<u>\$851,600</u>	<u>\$869,100</u>	<u>+ \$17,500</u> + 2.1%
<i>Cost of sales</i>			
Cost of food used	\$319,500	\$335,100	+ \$15,600 + 4.9%
Less: employee meals	(30,100)	(32,500)	+ (2,400) + 8.0%
<i>Net food cost</i>	(289,400)	(302,600)	+ 13,200 + 4.6%
<i>Beverage cost</i>	33,000	38,600	5,600 + 17.0%
<i>Net total cost of sales</i>	<u>(\$322,400)</u>	<u>(\$341,200)</u>	<u>+ \$18,800</u> + 5.8%
<i>Gross margin</i>	<u>\$529,200</u>	<u>\$527,900</u>	<u>- \$ 1,300</u> - 0.2%
<i>Departmental expenses</i>			
Salaries and wages	\$277,400	\$304,500	+ \$27,100 + 9.8%
Employee benefits	34,500	37,800	+ 3,300 + 9.6%
China, glassware	7,100	7,800	+ 700 + 9.9%
Cleaning supplies	6,400	6,800	+ 400 + 6.3%
Decorations	2,200	1,800	- 400 - 18.2%
Guest supplies	6,500	7,000	+ 500 + 7.7%
Laundry	15,500	18,400	+ 2,900 + 18.7%
Licenses	3,400	3,500	+ 100 + 2.9%
Linen	3,700	4,200	+ 500 + 13.5%
Menus	2,000	2,500	+ 500 + 25.0%
Miscellaneous	800	1,100	+ 300 + 37.5%
Paper supplies	4,900	5,700	+ 800 + 16.3%
Printing, stationery	4,700	4,600	- 100 - 2.1%
Silver	2,300	2,100	- 200 - 8.7%
Uniforms	3,100	2,400	- 700 - 22.6%
Utensils	1,700	1,800	+ 100 + 5.9%
<i>Total expenses</i>	<u>(376,200)</u>	<u>(412,000)</u>	<u>+ 35,800</u>
<i>Departmental income</i>	<u>\$153,000</u>	<u>\$115,900</u>	<u>- \$37,100</u>
			<u>+ 9.5%</u>
			<u>- 24.2%</u>

EXHIBIT 3.3

Comparative (Horizontal Analysis) of Income Statements

All other things are, obviously, not equal, because analysis of costs shows that the majority of them have increased at a greater rate than the revenue increase. To select only one example, the laundry cost has gone up \$2,900 over the year, or 18.7 percent. Are we using more linen than before? Has our supplier increased the cost to us by this percentage? Whatever the reason, corrective action can be taken once the cause is known. Each expense should be analyzed. In this particular illustration, assuming the increased costs were inevitable, perhaps the increased costs have not yet been incorporated into the menu selling prices.

COMMON-SIZE VERTICAL ANALYSIS OF INCOME STATEMENTS

Income statements can also be converted to a common-size vertical analysis format. With the conversion of the income statement, total sales revenue takes the value of 100 percent and all other items on the income statement are expressed as a fraction of total sales revenue. However, for the cost of sales, the cost of each product is divided by its respective sales revenue. Therefore, the cost of sales—food is divided by food sales revenue and the cost of sales—beverage is divided by beverage sales revenue. A common-size income statement is illustrated in Exhibit 3.4. For example, in Year 0003 dining room sales revenue was 23.7 percent of total sales revenue and is calculated as follows:

$$\begin{array}{rclcl} \text{Dining sales revenue} & / & \text{Total sales revenue} & = & \% \text{ of Total sales revenue} \\ \$201,600 & / & \$851,600 & = & \underline{\underline{23.7\%}} \end{array}$$

All items except the cost of sales in Exhibit 3.4 are calculated the same way, using \$851,600 as the denominator and the individual item as the numerator. Note that the percentage given for gross profit is a nonaccount subtotal and cannot be included to arrive at the 100 percent total of the other items' percentages. Gross profit (also called gross margin) is a derived subtotal representing sales revenue minus cost of sales and does not represent an operating cost, nor does it represent the resulting profit or loss from operations.

Expense items, except the cost of sales, also use \$851,600 as the denominator for Year 0003. For example, the cost of salaries and wages would be calculated as follows:

$$\$277,400 / \$851,600 \times 100 = \underline{\underline{32.6\%}}$$

However, net food cost is calculated as follows for Year 0003:

$$[\$289,400 / (\$851,600 - \$111,200)] \times 100 = \underline{\underline{39.1\%}}$$

One way of interpreting the common-size income statement information in Year 0003 is to say that, out of every \$1.00 of sales revenue, 37.9 cents was for

total cost of sales, 32.6 cents was for salaries and wages, 4.1 cents was for employee benefits, and 7.6 cents was for all other operating expenses, leaving only 18.0 cents for income. In Year 0004, this income was down to 13.3 cents out of every \$1.00 of revenue. Common-size income statements show which items, as a proportion of revenue, have changed enough to require investigation.

For example, one of the causes for the decline to 13.3 cents of departmental income from each dollar of sales revenue in Year 0004 is that the amount spent on total cost of sales has risen from 37.9 cents to 39.3 cents out of each dollar of sales revenue. This 1.4-cent increase might seem insignificant, but if it had not occurred, we would have made \$12,167 more income, calculated as follows:

$$\text{\$869,100} \times 1.4\% = \underline{\text{\$12,167}}$$

In the interest of brevity in Exhibit 3.4, a number of expenses have been added together under “all other operating expenses.” In Year 0003, this figure is 7.6 percent of revenue, and in Year 0004, 8.0 percent of revenue. This is a relatively small change and might normally be unnoticed. It is small only because several of the individual items that decreased offset many of the individual expense items that increased, thus hiding the facts. In practice, it would be best to detail each individual expense and express it as a percentage of revenue to have full information.

The income statement illustrated for the food operation was analyzed with both comparative horizontal (Exhibit 3.3) and common-size vertical methods (Exhibit 3.4). Normally, only one or the other would be used. They each draw attention, albeit in a different way, to problem areas requiring investigation, and, if necessary, corrective action. However, sometimes one technique will identify problems that should be investigated that the other technique may not indicate. Therefore, sometimes it is a good idea to complete both a comparative and common-size vertical analysis.

Note again that the common-size vertical analysis method is the more appropriate one to use when comparing two companies whose size or scale of operation is quite different.

There is one other method of horizontal comparative analysis particularly suited to the food operation, and that is to calculate and compare average sales revenue per guest, average cost per guest, and average income per guest information.

AVERAGE CHECK, COST, AND INCOME PER GUEST

Averages for sales revenue and cost functions are another useful tool to help analyze the income statement. When using averages, understanding how to calculate averages is essential. The question is to find the per-guest average—but of what? “What” can be identified as total sales revenue, revenue by division, total cost, or cost by category. A per-guest average can be determined using the following concept: sales revenue / guests, cost / guests, or operating income /

	Year Ending December 31		Year Ending December 31	
	0003	0004	0003	0004
<i>Sales revenue</i>				
Dining room	\$201,600	\$221,900	23.7%	25.5%
Coffee shop	195,900	201,700	23.0%	23.2%
Banquets	261,200	241,100	30.7%	27.7%
Room service	81,700	82,600	9.6%	9.5%
Bar	111,200	121,800	13.1%	14.0%
<i>Total sales revenue</i>	\$851,600	\$869,100	100%	100%
<i>Cost of sales</i>				
Cost of sales food	\$319,500	\$335,100	43.2%	44.8%
Less: employee meals	(30,100)	(32,500)	(4.1%)	(4.3%)
<i>Net cost of sales—food</i>	(289,400)	(302,600)	(39.1%)	(40.5%)
<i>Cost of sales—beverage</i>	33,000	38,600	29.7%	31.7%
<i>Net total cost of sales</i>	(\$322,400)	(\$341,200)	37.9%	39.3%
<i>Gross margin</i>	\$529,200	\$527,900	62.1%	60.7%
<i>Departmental expenses</i>				
Salaries and wages	\$277,400	\$304,500	32.6%	35.0%
Employee benefits	34,500	37,800	4.1%	4.3%
Other operating expenses	64,300	69,700	7.6%	8.0%
<i>Total expenses</i>	(376,200)	(412,000)	(44.2%)*	(47.4%)*
<i>Departmental income</i>	\$153,000	\$115,900	18.0%*	13.3%

*This does not add up due to rounding.

EXHIBIT 3.4

Common-Size Vertical Analysis Income Statement—Food Department

guests. Exhibit 3.5 shows two consecutive years of sales revenue, associated operating costs, and operating income (income before taxes). Two columns have been added: the first identifies the number of guests served by each revenue division and the costs incurred by each major cost category; the second shows the average check and average cost per guest. The averages for several different items in Year 0006 are as follows:

Total sales revenue	/	Total guests	=	Avg. total check per guest
\$2,554,800	/	215,560	=	\$11.85
Dining room sales revenue	/	Total dining room guests	=	Avg. check dining room guest
\$604,800	/	35,130	=	\$17.22
Net food cost	/	Total guests	=	Avg. food cost per guest
\$967,200	/	215,560	=	\$4.49
Total cost	/	Total guests	=	Avg. cost per guest
\$2,095,800	/	215,560	=	\$9.72
Operating income	/	Total guests	=	Avg. operating income per guest
\$459,000	/	215,560	=	\$2.13

When we analyze the information in Exhibit 3.5, we see that the number of guests served in all sales revenue areas increased—except in banquets, where there was a decrease of 9,410 (60,190 – 50,780). This is a decrease of 15.6 percent (9,410 / 60,190, then multiplied by 100). At the same time, in the banquet area the average check per guest increased from \$13.02 to \$14.24. This is an increase of \$1.22 per guest, or 9.4 percent (\$1.22 / \$13.02, then multiplied by 100). The combination of higher average check (average revenue) but reduced numbers of guests meant that banquet revenue was \$60,300 lower in Year 0007 than in Year 0006. Is this a desirable trend? Is our banquet selling policy causing us to sell higher-priced banquets but not allowing us to sell to as many customers? Has an increase in selling prices driven away a considerable amount of business?

In terms of total average revenue per guest for the food operation in Year 0007, we took in 12 cents more per guest (\$11.97 – \$11.85) but we spent 66 cents more per guest (\$10.38 – \$9.72), and thus our income per guest declined 53 cents (\$2.13 – \$1.60). Obviously, our costs per guest have risen much faster than our revenue per guest. The individual items of expense, on a per-guest basis, have all increased, some more than others. They need to be investigated to see whether the trend can be reversed. Alternatively, sales prices might need to be increased to compensate for uncontrollable, increasing costs.

Although Exhibit 3.5 illustrated a food operation, a beverage department could be analyzed equally as well using the same approach. Similarly, a hotel

	Year Ending December 31, 0006			Year Ending December 31, 0007		
	<i>Sales Revenue</i>	<i>Guests</i>	<i>Average Check</i>	<i>Sales Revenue</i>	<i>Guests</i>	<i>Average Check</i>
<i>Department</i>						
Dining room	\$ 604,800	35,130	\$17.22	\$ 665,700	36,210	\$18.38
Coffee shop	587,700	71,200	8.25	605,100	78,200	7.74
Banquets	783,600	60,190	13.02	723,300	50,780	14.24
Room service	245,100	16,870	14.53	247,800	17,110	14.48
Bar	333,600	32,170	10.37	365,400	35,490	10.30
<i>Totals</i>	<u>\$2,554,800</u>	<u>215,560</u>	<u>\$11.85</u>	<u>\$2,607,300</u>	<u>217,790</u>	<u>\$11.97</u>
	<i>Cost</i>	<i>Guests</i>	<i>Average Cost</i>	<i>Cost</i>	<i>Guests</i>	<i>Average Cost</i>
<i>Operating Costs</i>						
Net food cost	\$ 967,200	215,560	\$ 4.49	\$1,023,600	217,790	\$ 4.70
Salaries and wages	832,200	215,560	3.86	913,500	217,790	4.19
Employee benefits	103,500	215,560	0.48	113,400	217,790	0.52
Other expenses	192,900	215,560	0.89	209,100	217,790	0.96
<i>Totals</i>	<u>\$2,095,800</u>	<u>215,560</u>	<u>\$ 9.72</u>	<u>\$2,259,600</u>	<u>217,790</u>	<u>\$10.38</u>
<i>Operating Income</i>	<u>\$ 459,000</u>	<u>215,560</u>	<u>\$ 2.13</u>	<u>\$ 347,700</u>	<u>217,790</u>	<u>\$ 1.60</u>

EXHIBIT 3.5

Comparative Average Check, Cost, and Operating Income per Guest—Food Department

rooms department could be analyzed using number of guests or number of rooms as the unit figure to be divided into sales revenue, costs, or income.

TREND RESULTS

Balance sheet and income statement illustrations discussed to this point have considered only an analysis, and comparison of data between two successive periods. Limiting an analysis to only two periods, weeks, months, or years, can be misleading if an unusual occurrence or factor distorted the results for either of the two periods. Looking at results over a greater number of periods can often be more useful in indicating the direction in which a business is heading. For example, the following shows trend results as a percentage for a cocktail lounge for six successive months:

<i>Month</i>	<i>Sales Revenue</i>	<i>Change in Revenue</i>	<i>Percentage Change</i>
1	\$25,000		-0-
2	30,000	+\$5,000	+20.0%
3	33,000	+ 3,000	+10.0%
4	35,000	+ 2,000	+ 6.1%
5	36,000	+ 1,000	+ 2.9%
6	36,000	0	0.0%

The trend percentage for the first period is always set to zero percent. For the first and subsequent years the trend percentage is determined as follows until the last year is evaluated:

Current period – Last period = \$ Change / Last period = Trend %						
\$30,000	–	\$25,000	=	\$5,000 /	\$25,000	= 20.0%
\$33,000	–	\$30,000	=	\$3,000 /	\$30,000	= 10.0%
\$35,000	–	\$33,000	=	\$2,000 /	\$33,000	= 6.1%

In the above, the change in sales revenue dollars for each period is calculated by subtracting from each period's sales revenue the sales revenue of the preceding period. The trend percentages are calculated by dividing each period's change in sales revenue dollar amounts by the sales revenue of the preceding period.

Over a long period of time, trend percentages will show the direction in which a business is going. In our particular case, the trend results indicate that although business has been increasing over the past few periods, it now seems to have leveled off. Has the business reached its maximum potential in sales revenue? Has an economic slowdown occurred? Trend percentages may be useful in such areas as forecasting or budgeting, or in decision making. For example, is it time we spent money on advertising to increase volume?

The particular trend result just illustrated was for a specific item (sales revenue in a bar), but comparison of trend percentages of related items (sales revenue and expenses) can be indicative of problems. For example, the cost of sales (liquor cost) figures for this lounge for the same six periods are as follows:

<i>Period</i>	<i>Liquor Cost</i>
1	\$ 7,500
2	9,200
3	10,300
4	10,800
5	11,100
6	11,200

This basic information regarding the liquor costs for six periods can also be evaluated to show a trend expressed as a percentage. We use the basic equation shown to evaluate the trend percentages for sales revenue to evaluate trend percentages for costs:

<i>Month</i>	<i>Liquor Costs</i>	<i>Cost Change</i>	<i>% Change</i>
1	\$ 7,500		-0-
2	9,200	\$1,700	+22.7%
3	10,300	1,100	+12.0%
4	10,800	500	+ 4.9%
5	11,100	300	+ 2.8%
6	11,200	100	+ 0.9%

These relationships are calculated very quickly, and can provide information in a simple format that show cost increases, and decreases for specific periods. An example using the basic equation is shown below for liquor costs:

<i>Month</i>	<i>Sales Revenue</i>	<i>Change in Revenue</i>	<i>Percentage Revenue Change</i>	<i>Liquor Cost</i>	<i>Change in Cost</i>	<i>Percentage Cost Change</i>
1	\$25,000		-0-	\$ 7,500	-0-	-0-
2	30,000	+\$5,000	+20.0%	\$ 9,200	\$1,300	22.7%
3	33,000	+ 3,000	+10.0%	\$10,300	\$1,100	12.0%
4	35,000	+ 2,000	+ 6.1%	\$10,800	\$ 500	4.9%
5	36,000	+ 1,000	+ 2.9%	\$11,100	\$ 300	2.8%
6	36,000	0	0.0%	\$11,200	\$ 100	0.9%

When we compare the percentage increase in sales revenue with the percentage increase in cost, we see that, in general, the liquor cost is increasing somewhat more quickly than the sales revenue with the exception of months 4 and 5. We need to investigate why this is occurring. Are there some problems with controlling the use of liquor? Has there been a change in sales mix so we are selling more expensive products? Do we need to increase menu prices to compensate for increased product cost that we cannot do anything about?

TREND INDEX ANALYSIS

An index is calculated by assigning a value of 100 (or 100%) in period one for each item being tabulated, as follows:

<i>Period</i>	<i>Sales Revenue</i>	<i>Revenue Index</i>	<i>Liquor Cost</i>	<i>Liquor Cost Index</i>
1	\$25,000	100	\$ 7,500	100.0
2	30,000	120	9,200	122.7
3	33,000	132	10,300	137.3
4	35,000	140	10,800	144.0
5	36,000	144	11,100	148.0
6	36,000	144	11,200	149.3

Dividing the dollar amount for each period by the base period dollar amount and multiplying by 100 calculates the trend index for each period. An example is given using two sales revenue periods and two liquor cost periods to calculate the trend index. The index number for the first, or base, period is set at 100, and subsequent period index numbers are calculated as follows:

<i>(Subsequent period / Base period) × 100 = Trend index</i>	
<i>Sales Revenue</i>	<i>Liquor Cost</i>
Period 2: $(\$30,000 / \$25,000) \times 100 = 120.0$	$(\$9,200 / \$7,500) \times 100 = 122.7$
Period 5: $(\$36,000 / \$25,000) \times 100 = 144.0$	$(\$11,100 / \$7,500) \times 100 = 148.0$

Our completed trend index results show us that the liquor cost has been increasing faster than liquor sales revenue. Expressed another way, sales revenue is up 44 percent ($144 - 100$) and liquor cost is up 49 percent ($149 - 100$). This is normally an undesirable trend that should be investigated and possibly corrected.

PRICE AND COST LEVEL CHANGES (INFLATION OR DEFLATION)

When comparing operating results, and in particular when analyzing trend figures, the reader must be aware of the effect that changing dollar values have on the results. One hundred pounds of vegetables a few years ago weighed exactly the same as 100 pounds of vegetables today, but the purchase cost was much lower. Prices change over time. In the same way that prices change for us, so, too, do the prices we must charge to customers for rooms, food, beverages, and other services. When comparing income and expense items over a fairly long period, it is necessary to consider the implications of upwardly changing prices or costs (inflation), or the reverse (deflation). Consider a restaurant with the following sales revenue in two successive years:

Year 1	\$100,000
Year 2	\$105,000

This is a \$5,000 or 5 percent ($\$5,000 / \$100,000$) increase in volume. But if restaurant menu prices had been increased over the year by 10 percent due to inflation, then our Year 2 sales revenue should have been at least \$110,000 just to stay even with Year 1's volume. In other words, when we try to compare sales revenue for successive periods in inflationary or deflationary times, as in this case, we are comparing unequal values. Last year's dollar does not have the same value as this year's. What a dollar would buy last year might now require \$1.10. Is there a method that will allow us to convert a previous period's dollars into current period dollars so trends can be analyzed more meaningfully? The answer is yes, with the use of index numbers.

The **consumer price index** is probably one of the most commonly used and widely understood indexes available. But the government and other organizations produce many other indexes. By selecting an appropriate index, conversion of the previous period's dollars into current year dollars is possible. Consider the following figures showing trend results for a restaurant's sales revenue for the past five years.

<i>Year</i>	<i>Sales Revenue</i>	<i>Change in Sales Revenue</i>	<i>Percentage Change</i>
1	\$420,000	\$ -0-	0.0%
2	450,000	30,000	7.1%
3	465,000	15,000	3.3%
4	485,000	20,000	4.3%
5	510,000	25,000	5.2%

The trend percentages show sales revenue has increased each year, which is generally a favorable trend. But is it reasonable to compare \$420,000 of sales revenue in Year 1 to \$510,000 of sales revenue in Year 5? By adjusting all past sales revenues to comparable Year 5 dollars, a more realistic picture of our restaurant's sales revenues may emerge. The trend index used to adjust sales revenue would be based on restaurant sales revenue, and we would need to use the trend numbers of the same five-year period for which we wish to adjust our restaurant sales revenue. Let us assume the index numbers were as follows:

<i>Year</i>	<i>Trend Index</i>
1	105
2	112
3	119
4	128
5	142

The equation for converting past period's (historic) dollars to current (real) dollars is as follows:

$$\text{Historic dollars} \times \frac{\text{Index number for current period}}{\text{Index number for historic period}} = \text{Current dollars}$$

The following table shows the trend index numbers used to convert the earlier sales revenue figures into today's current dollars (rounded to the nearest hundreds of dollars).

<i>Year</i>	<i>Index</i>	<i>Historic Sales Revenue</i>	<i>×</i>	<i>Conversion Equation</i>	<i>=</i>	<i>Current Dollars</i>
1	105	\$420,000	×	142 / 105	=	\$568,000
2	112	450,000	×	142 / 112	=	570,500
3	119	465,000	×	142 / 119	=	554,900
4	128	485,000	×	142 / 128	=	538,000
5	142	510,000	×	142 / 142	=	510,000

The resulting picture is quite different from the unadjusted sales revenue figures. In fact, in current dollars, our annual sales revenue has generally declined from Year 1 to Year 5. This would not normally be a desirable trend.

If restaurant sales revenue trend index numbers were not readily available, an operator could easily compile them by converting the annual average check figure for each of a number of years to an index, giving Year 1 the value of 100. This is illustrated as follows:

<i>Year</i>	<i>Check</i>	<i>Average Trend Index</i>
1	\$10.20	100.0
2	11.01	107.9
3	12.06	118.2
4	12.63	123.8
5	13.68	134.1

Dividing the average check for each year by the average check for Year 1 and multiplying by 100 calculates the trend index numbers for each year. For example, we can compute the Year 3 and Year 5 index numbers:

$$\text{Year 3: } (\$12.06 / \$10.20) \times 100 = \underline{\underline{118.2}}$$

$$\text{Year 5: } (\$13.68 / \$10.20) \times 100 = \underline{\underline{134.1}}$$

If this technique looks familiar, it is. This is the same method used to determine the trend index numbers illustrated in an earlier discussion, and can also be used for cost functions.

A restaurant creating its own trend index in this way might find it much more accurate because it reflects only what has happened to prices within that restaurant. A national average restaurant trend index might have factors built into it that have no bearing on any one individual operation. Preferably, such an individual trend index should be used only if the size and nature of the operation have not changed during the period under review; otherwise, the results could be misleading.

Once the trend index has been prepared, it can be applied using the equation already demonstrated to convert historic sales revenue to current dollars. A bar could use the same type of homemade trend index using average customer spending. For its room sales revenue, a hotel or motel could use average room rates converted to a trend index.

Costs can be converted in the same way, using an appropriate trend index for the particular expenses or costs under review. For example, a wage trend index would probably be appropriate for adjusting cost of labor. Alternatively, an individual establishment might be able to construct its own trend index for each individual expense, as was just demonstrated for room prices, basing the trend indexes on a cost per guest or cost per room occupied. In fact, complete income statements for past periods can be reconstructed by converting them in their entirety to current period, or current year, dollars.

Such wholesale conversions would probably go beyond the needs of the managers of most hotel or food service operations. However, whether or not a major accounting conversion is used, the implications of price and cost level changes should not be ignored.

The same problems also apply to balance sheets. A balance sheet showing a cash balance on hand of \$100,000 in each of two successive years might seem to indicate no change in the cash position. But will \$100,000 now buy as much as \$100,000 a year ago? Similarly, the historic cost of land, buildings, and equipment on balance sheets may also be misleading. However, a complete and comprehensive discussion of inflation accounting or current dollar accounting is far beyond the scope of this book.

COMPUTER APPLICATIONS

With a spreadsheet program, a computer can prepare and print out both comparative and common-size vertical balance sheets and income statements, including the relevant dollar and percentage changes. In addition, spreadsheets have a graphics capability that can provide management with more easily interpreted

information about the trend of specific items. These graphs can be presented in various forms, such as bar graphs or pie charts.

S U M M A R Y

Financial statement analysis is a matter of relating the various parts of the statements to each other and to the whole, and then interpreting the results. Different users of financial statements are interested in different sections and specific items and most likely will have different interpretations of the information being viewed. It is most likely that different readers of financial statements may arrive at different conclusions based on the results of their analysis.

Comparative horizontal analysis as demonstrated in this chapter is one technique used to analyze financial statements. This involves putting two consecutive balance sheets or two consecutive income statements side by side and showing the changes in numerical value and the percentage that change represents for each line item, subtotals, and totals. The analysis will conclude with an interpretation of the results. The general equation is:

$$(\text{Period 2} - \text{Period 1}) = \$ \text{ Change} / \text{Period 1} = \% \text{ Change}$$

Common-size vertical analysis of financial statements requires only one balance sheet or one income statement. A common-size vertical analysis of a balance sheet will express each item, subtotal, and total as a percentage of total assets. A common-size vertical analysis of an income statement will divide each item (except cost of sales), subtotal, and total appearing in the income statement by total sales revenue, which expresses the percentage of each element as a percentage of total sales revenue. Cost of sales is normally divided by its respective sales revenue.

$$\text{Revenue item} / \text{Total sales revenue} = \% \text{ of total sales revenue}$$

or

$$\text{Cost item} / \text{Total sales revenue} = \% \text{ of total sales revenue}$$

and

$$\text{Cost of sales food} / \text{Sales revenue food} = \% \text{ of food sales revenue}$$

or

$$\begin{aligned} \text{Cost of sales beverage} / \text{Sales revenue beverage} \\ = \% \text{ of beverage sales revenue} \end{aligned}$$

Another useful approach in the evaluation of an income statement is to find the average check per guest for each sales division, cost per guest by items, and operating income and net income (after tax) figures on an average per-guest basis.

Sales revenue / Guests = Average sales revenue per guest

Cost item / Guests = Average cost per guest

Operating income / Guests = Average operating income per guest

Trend results are similar to comparative and common-size statements, except that they show figures for several successive periods, showing the change in dollars and the percentage change from each period to the next:

Current period – Last period = \$ Change / Last period = Trend %

A refinement of the raw trend percentage figures is a trend index. A trend index begins with the assignment of a 100 (or 100%) for the first period, which is the base period, monthly, quarterly, or yearly. Subsequent periods of sales revenue or cost figures are expressed as a percentage of the sales revenue or cost figures used in the first period. Trend index numbers are calculated as follows:

(Subsequent period / Base period) × 100 = Trend index

When analyzing financial results for two or more successive years, inflation implications should be considered. To convert previous historical period dollars into current period dollars, an appropriate trend index can be used:

Historic dollars × $\frac{\text{Index number current period}}{\text{Index number historic period}}$ = Current dollars

DISCUSSION QUESTIONS

1. Explain what items a stockholder reading a financial statement might be interested in that are different from the manager of the enterprise.
2. What is comparative horizontal balance sheet analysis?
3. Discuss absolute and relative changes with reference to comparative horizontal financial statement analysis.
4. Why are differences between two comparative statements frequently better shown in percentages rather than only in dollars?
5. What is the objective of common-size vertical income statements?
6. How is average sales revenue per guest calculated?

7. Why are trend results often more meaningful than a comparison limited to two successive accounting periods?
8. How is a trend index calculated?
9. In inflationary times, why is comparative analysis and a trend index misleading?
10. What is the equation for converting past historic period dollars to current period dollars?

ETHICS SITUATION

A restaurant manager has received a bonus for each of the past five years based on increases in sales revenue that have averaged about 5 percent over the previous year. The restaurant owner asked to have the sales revenue figures for the last five years adjusted for inflation and the manager has an accountant adjust the figures. On reviewing the results, the manager notices that sales revenues have remained virtually flat and in one year, sales revenues actually declined slightly. Before submitting the adjusted figures to the owner, the manager decides to change them to show that sales revenue increases averaged approximately 3 percent a year. By changing the adjusted figures, the manager hopes to show the owner the annual bonuses were justified. Discuss the ethics of this situation.

EXERCISES

- E3.1** A restaurant owner expressed concern about the changes in the cash, credit card receivables, and food and beverage inventories accounts in the months of July and August of the current year. He wants you to show him the dollar changes and the percentage of change for each of these accounts using comparative horizontal analysis.

	<i>July</i>	<i>August</i>
Cash	\$ 8,880	\$ 7,104
Credit card receivables	1,240	1,984
Food inventories	4,480	6,272
Beverage inventories	2,220	1,887
Total current assets	<u>\$16,820</u>	<u>\$17,247</u>

- E3.2** Complete a common-size vertical analysis for the months of July and August using E3.1's data.

- E3.3** Complete a common-size vertical analysis of the condensed income statement presented below.

Condensed Income Statement

Sales revenue	\$480,000
Cost of sales	<u>203,600</u>
Gross margin	\$276,400
Operating expenses	<u>202,400</u>
Operating income	<u>\$ 74,000</u>

- E3.4** A room's operation had an average room rate of \$48.00 in the first year, \$44.00 in Year 2, and \$53.00 in Year 3. Establish a trend index starting with the average room rate for the first year and determine the index numbers for Year 2 and Year 3.

- E3.5** Based on the following, determine the average check per guest.

	<i>Sales Revenue</i>	<i>Guests</i>
Dining room	\$128,880	9,206
Bar-Lounge	\$ 66,586	5,202

- E3.6** Based on the following, determine the average cost of sales revenue per guest.

	<i>Cost of Sales Revenue</i>	<i>Guests</i>
Dining room	\$51,552	9,206
Bar-Lounge	\$22,386	5,202

- E3.7** The following data from a restaurant operation show a partially completed comparative income statement analysis for two consecutive years. Determine and fill in the missing values and percentages.

	<i>Year 0003</i>	<i>Year 0004</i>	<i>Changes</i>	
			<i>Dollars</i>	<i>%</i>
Sales revenue	\$23,502	\$	+1,110	
Cost of sales revenue	<u>− 9,208</u>	<u>− 9,438</u>		+2.5%
Gross margin	\$	\$	\$	
Direct costs	<u>−10,202</u>		<u>+1,420</u>	
Contributory income	\$	\$ 3,552		
Indirect costs	<u>− 2,477</u>			−3.0%
Operating income	<u>\$</u>	<u>\$ 1,149</u>	<u>\$</u>	

E3.8 Sales revenue for a restaurant operation is given for the months of March, April, and May of Year 0004. The index numbers are stated for each month. Convert March, April, and May to current dollars. Round answers to the nearest dollar.

<i>Year 0004</i>	<i>Sales Revenue</i>	<i>Index Number</i>
March	\$38,000	110
April	\$40,000	112
March	\$44,000	115

P R O B L E M S

P3.1 Present in the proper form a comparative horizontal analysis of the corporate balance sheet shown below. Comment on any items of difference that you consider significant.

<i>ASSETS</i>	<i>Year 0004</i>	<i>Year 0005</i>
<i>Current Assets</i>		
Cash	\$ 11,300	\$ 15,400
Credit card receivables	3,900	6,300
Accounts receivable	11,700	18,900
Vending inventories	7,800	8,400
Prepaid expenses	3,900	4,100
<i>Total Current Assets</i>	<u>\$ 38,600</u>	<u>\$ 53,100</u>
<i>PROPERTY PLANT AND EQUIPMENT</i>		
Land	\$ 81,200	\$ 81,200
Building	758,100	795,300
Furnishings	83,712	93,412
Equipment	90,688	90,688
Accumulated depreciation	(315,500)	(335,800)
Glassware, linen inventories	12,200	15,300
<i>Total Property & Equipment (net)</i>	<u>\$710,400</u>	<u>\$740,100</u>
<i>Total Assets</i>	<u>\$749,000</u>	<u>\$793,200</u>
<i>LIABILITIES & STOCKHOLDERS' EQUITY</i>		
<i>Current Liabilities</i>		
Accounts payable	\$ 9,100	\$ 12,200
Accrued expenses payable	4,200	4,900
Taxes payable	12,400	15,500
Current portion, mortgage payable	13,600	11,200
<i>Total Current Liabilities</i>	<u>\$ 39,300</u>	<u>\$ 43,800</u>

(continued)

LIABILITIES & STOCKHOLDERS' EQUITY (con'd)	Year 0004	Year 0005
<i>Long-Term Liabilities</i>		
Mortgage payable	\$423,500	\$412,300
<i>Total Liabilities</i>	\$462,800	\$456,100
<i>Stockholders' Equity</i>		
Capital stock	\$125,200	\$145,200
Retained earnings	161,000	191,900
<i>Total Stockholders' Equity</i>	<u>\$286,200</u>	<u>\$337,100</u>
<i>Total Liabilities & Stockholders' Equity</i>	<u><u>\$749,000</u></u>	<u><u>\$793,200</u></u>

- P3.2** Using the information shown in Problem 3.1, complete a common size vertical balance sheet analysis in proper form for Year 0004 and Year 0005. Comment on any changes you consider significant.
- P3.3** The following information has been extracted from a hotel's food department for the months of August and September.

<i>Departmental Divisions</i>	<i>Month of August</i>		<i>Month of September</i>	
	<i>Revenue</i>	<i>Guests</i>	<i>Revenue</i>	<i>Guests</i>
Room service	\$ 22,600	927	\$18,000	756
Dining room	118,500	4,628	95,500	3,765
Bar-Lounge	5,500	846	4,100	637
Coffee shop	53,400	9,709	48,700	8,604
Banquets	198,600	6,687	211,500	6,805
Totals	<u>\$398,600</u>	<u>22,797</u>	<u>\$377,800</u>	<u>20,567</u>

	<i>Month of August</i>	<i>Month of September</i>
Cost of sales	\$136,200	\$127,800
Wage-Salaries expense	107,900	101,500
Benefits expense	14,000	14,500
Linen expense	6,400	6,000
China expense	10,600	9,800
Supplies expense	9,800	9,400
Other expenses	19,200	17,600
Total expenses	<u>\$304,100</u>	<u>\$286,600</u>
Departmental operating income	<u>\$ 94,500</u>	<u>\$ 91,200</u>

- Calculate average check per guest for each sales revenue division for the months of August and September.
- Calculate the average cost per guest and total average cost for each month.

- c. Determine the departmental operating income per guest for each month.

P3.4 A company owns two restaurants in the same town. Operating results for the first three months of the current year for restaurants A and B:

	<i>Restaurant A</i>		<i>Restaurant B</i>	
<i>Sales Revenue</i>		\$154,300		\$206,100
<i>Cost of sales</i>		<u>– 60,200</u>		<u>– 78,900</u>
<i>Gross margin</i>		<u>\$ 94,100</u>		<u>\$127,200</u>
<i>Direct Costs</i>				
Wages expense	\$45,600		\$70,400	
Supplies expense	12,700		16,800	
Other direct costs	<u>4,500</u>	<u>– 62,800</u>	<u>6,100</u>	<u>– 93,300</u>
<i>Contributory Income</i>		<u>\$ 31,300</u>		<u>\$ 33,900</u>
<i>Indirect Costs</i>				
Rent expense	\$ 6,500		\$ 9,000	
Insurance expense	2,000		3,000	
Other indirect expenses	<u>3,200</u>	<u>– 11,700</u>	<u>3,600</u>	<u>– 15,600</u>
<i>Operating Income</i>		<u><u>\$ 19,600</u></u>		<u><u>\$ 18,300</u></u>

The owners of the restaurants are concerned that restaurant B reports higher sales revenue, yet produces a lower operating income than restaurant A. Convert the information shown above into a common-size vertical income statement for each restaurant, and comment on the results.

P3.5 The sales revenue, food cost of sales, and guests served for a small fast-food carryout division of a restaurant for the past six months are given below.

<i>Month</i>	<i>Sales Revenue</i>	<i>Cost of Sales, Food</i>	<i>Guests Served</i>
1	\$258,200	\$ 96,200	10,200
2	274,800	104,300	10,400
3	285,600	110,500	10,300
4	289,400	113,100	10,100
5	298,300	118,900	10,400
6	304,600	123,700	10,500

For each of the six months calculate average check and average costs of sales food. Using these averages, calculate an index number. Set the index for month 1 at 100 and complete index numbers for the remaining five months. With the index numbers identified, convert sales revenue and cost of sales food from historic to current dollars.

- P3.6** A motel had the following annual sales revenue and average room rate figures for the last five years. During this five-year period there were no changes in the number or type of rooms available and the clientele remained basically the same.

<i>Year</i>	<i>Annual Sales Revenue</i>	<i>Average Room Rate</i>
1	\$1,401,429	\$75.00
2	\$1,429,367	\$76.30
3	\$1,480,552	\$77.60
4	\$1,520,700	\$78.50
5	\$1,553,091	\$79.90

Prepare trend index numbers from the average room rates using 100 as the base index number for year 1. Use the index numbers identified to convert the reported yearly sales revenue to current dollars. After the conversion is completed, comment on the results of your analysis.

- P3.7** Two successive monthly income statements for the food department of a motor lodge are shown below. Present the income statements in a comparative horizontal analysis format.

	August	September
<i>Sales Revenue</i>		
Room service	\$11,300	\$ 9,000
Dining room	75,900	63,700
Bar-lounge	5,500	4,100
Coffee shop	53,400	48,700
Banquets	66,200	70,500
<i>Total Sales Revenue</i>	\$212,300	\$196,000
<i>Cost of Sales</i>	(68,100)	(63,900)
<i>Gross Margin</i>	<u>\$144,200</u>	<u>\$132,100</u>
<i>Operating Expenses</i>		
Wages and salaries	\$75,800	\$71,100
Employee benefits	11,400	10,700
Linen and laundry	3,200	3,000
China, glassware, & tableware	5,300	4,900
Miscellaneous operating costs	4,900	4,700
Operating supplies	9,600	8,800
<i>Total Operating Expenses</i>	(110,200)	(103,200)
<i>Departmental Operating Income</i>	<u>\$ 34,000</u>	<u>\$ 28,900</u>

- P3.8** Using the information presented in Problem 3.7, present in proper format a common-size vertical income statement analysis. Comment on any significant results noted.

P3.9 You have the following information concerning a fast-food restaurant for three consecutive months.

	<i>April</i>	<i>May</i>	<i>June</i>
Sales revenue	\$120,500	\$141,300	\$165,900
Cost of sales	\$41,500	\$51,500	\$62,800
Wages expense	34,200	42,100	51,900
Other expenses	22,000	\$ 97,700	25,100
Departmental income	\$ 22,800	\$ 22,600	\$ 22,100
Guests served	20,200	24,400	29,900

Convert the consolidated income statements to common size. Use the number of customers to prepare additional analyses. Comment on what is happening in this operation using the information you have calculated.

P3.10 Freddy's Fried Chicken provides you with the following information from 2 successive months of his operation:

	<i>Month 1</i>	<i>Month 2</i>
Sales revenue—food	\$199,000	\$213,500
Sales revenue—beverage	72,000	74,000
Total Sales Revenue	\$271,000	\$287,500
Cost of sales—food	\$ 71,500	\$ 82,000
Cost of sales—beverage	16,900	19,900
Labor expense	76,000	85,000
Other expenses	77,000	82,000
Total expenses	\$241,400	\$268,900
Operating Income [BT]	\$ 29,600	\$ 18,600

Using the above information, complete the following:

- Convert the income statement to common-size vertical analysis.
- Convert the income statement to a comparative horizontal analysis.
- With this information and the added information that a total of 20,000 guests were served in Month 1 and 22,000 in Month 2, comment on Freddy's operating results for the 2 months.
- Compare the information you received from the common-size vertical analysis and the comparative horizontal analysis.

P3.11 You have the following information about Hotshot Hotel's dining room for the months of October and November:

	<i>October</i>	<i>Guests</i>	<i>November</i>	<i>Guests</i>
Food sales	\$ 85,432	2,748	\$ 81,718	2,645
Beverage sales	\$ 33,249	2,542	\$ 37,555	2,444
Total Sales	\$118,681	5,290	\$119,273	5,089
Food cost	\$ 32,525	2,748	\$ 29,487	2,645
Beverage cost	\$ 10,000	2,542	\$ 11,547	2,444
Labor cost	\$ 32,352	5,290	\$ 31,081	5,089
Other costs	\$ 21,154		\$ 20,550	
Total Expenses	\$ 96,031	5,290	\$ 92,665	5,089
Department Operating Income	\$ 22,650	5,290	\$ 26,608	5,089

Use this information to comment about the dining room's operating results for October and November.

P3.12 You have the following information about the revenue, cost of sales, and accounts receivable for six consecutive periods for a restaurant:

<i>Period</i>	<i>Food Sales</i>	<i>Food Cost</i>	<i>Accounts Receivable</i>
1	\$201,100	\$60,200	\$20,800
2	\$226,800	\$72,500	\$25,100
3	\$238,900	\$81,400	\$26,900
4	\$248,400	\$84,200	\$28,100
5	\$260,700	\$90,600	\$31,300
6	\$265,900	\$93,200	\$33,400

For each of the three items, calculate trend percentages. Using the results from this analysis, discuss whether or not the situation developing for this restaurant is desirable.

P3.13 Assume that appropriate general index numbers for restaurant revenue and restaurant food and beverage costs were as follows for the six periods referred to in Problem 3.12.

<i>Period</i>	<i>Revenue Index</i>	<i>Cost Index</i>
1	107.0	121.0
2	114.0	125.0
3	121.0	131.0
4	130.0	137.0
5	144.0	144.0
6	147.0	151.0

Convert the historic dollars of revenue and the historic dollars of cost of sales in Problem 3.12 to current dollars and discuss the results.

- P3.14** A motel had the following annual sales revenue and average room rate figures for the last five years. During this five-year period, there were no changes in the number or type of rooms available and the type of clientele remained the same.

<i>Year</i>	<i>Annual Sales Revenue</i>	<i>Average Room Rate</i>
1	\$2,205,952	\$85.00
2	\$2,254,695	\$88.60
3	\$2,299,526	\$89.70
4	\$2,334,484	\$91.40
5	\$2,380,856	\$93.80

Prepare index numbers from the average room rates. Use the index numbers identified to convert the annual sales revenue to current dollars. After the conversion is completed, comment on the results of your analysis.

CASE 3

- With reference to the financial statements prepared for the 4C Company for Year 2004 (see Case 2), prepare a common-size statement. The local restaurant association provided Charlie with statistical data that are applicable for a table service, family-oriented, lunch and dinner restaurant similar to his (see next page). The data provide percentage ranges for typical elements of an income statement. Comment on how the operating income (income before tax) of the 4C restaurant compares to similar restaurants. Is this a valid comparison? Explain.
- The guest count (covers) for the 4C restaurant for the year was 66,612. Determine the overall average check (revenue) for food and beverages. In your opinion, does the average check for food and beverages appear reasonable for a budget-conscious, family-type table service restaurant?
- Calculate the cost percentages for food cost, beverage cost, and the total cost of sales as a percentage of sales revenue. How does cost of sales for food, beverages, and the total cost of sales compare to the ranges provided for a restaurant of this type?
- Given the choice, would it be better to have a higher or lower percentage of beverage sales revenue compared to food sales revenue?

	Low (%)	High (%)
<i>Sales Revenue</i>		
Food operations	70.0	80.0
Beverage operations	<u>20.0</u>	<u>30.0</u>
Total Sales Revenue		100%
Cost of Sales, Food	30.0%	44.0%
Cost of Sales, Beverages	23.0%	38.0%
Total Cost of Sales	35.0%	44.0%
<i>Gross Margin</i>	56.0%	65.0%
<i>Operating Expenses</i>		
Wages expense	26.0%	31.0%
Salaries expense	2.0%	6.0%
Employee benefits expense	3.0%	5.0%
Employee meals expense	1.0%	2.0%
Laundry, linen, uniforms expense	1.5%	2.0%
Replacements expense	0.5%	1.0%
Services supplies expense	1.0%	2.0%
Menus, printing expense	0.3%	0.5%
Miscellaneous expense	0.3%	0.5%
Entertainment expense	0.5%	2.0%
Advertising, promotion expense	0.7%	2.5%
Utilities expense	2.0%	4.0%
Administrative expense	3.0%	6.0%
Repairs, maintenance expense	1.0%	2.0%
Rent expense	4.5%	7.0%
Property taxes expense	0.5%	1.5%
Insurance expense	0.8%	1.0%
Interest expense	0.3%	1.0%
Depreciation expense	2.0%	2.8%
Franchise expense (if applicable)	<u>3.0%</u>	<u>8.0%</u>
<i>Total operating expenses</i>	<u>51.5%</u>	<u>62.5%</u>
<i>Operating income (before tax)</i>	<u>1.5%</u>	<u>12.0%</u>