

RATIO ANALYSIS

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

The preceding chapters concentrated on developing a general but solid understanding of accounting principles and concepts and their applications to business transactions. Knowing how an accounting system works internally creates an understanding of the source and specific nature of information needed for the preparation of financial statements. This chapter continues financial statement analysis by discussing significant financial and other various ratios, with the objective of obtaining indirect information about economic actions. Ratio analysis expresses the proportional numerical relationships between figures reported in financial statements and are used to compare current period ratios to prior periods and indus-

try averages. To effectively analyze the different figures, one must know where to look for the information needed to conduct a ratio analysis.

To express the relationship between two values, various commonly used ratios are illustrated. Four general methods of evaluating a ratio or percentage will be discussed: industry figures, external competitive figures, the results of operations from a previous period, and predetermined budgetary standards. Typical ratio analysis techniques commonly used by a business to express the status of its operations, financial, and economic condition, are broken into five major categories: current liquidity ratios, long-term solvency ratios, profitability ratios, activity, and operating ratios.

C H A P T E R O B J E C T I V E S

After studying this chapter, the reader should be able to

- 1 Explain the differences between creditors, owners, and managers in what they look for in financial statements.

- 2 Explain why creditors are normally concerned with specific areas of financial statements.
 - 3 List and briefly explain each of the current liquidity ratios discussed and illustrated.
 - 4 Explain the purpose of an analysis of credit card receivables.
 - 5 List and briefly explain each of the solvency ratios.
 - 6 List and briefly describe each of the profitability ratios.
 - 7 List and briefly explain each of the activity ratios.
 - 8 Discuss the importance of inventory turnover ratios.
 - 9 List and describe at least five food and beverage operating ratios.
 - 10 List and describe at least five rooms operating ratios.
 - 11 Explain the meaning of gross margin.
 - 12 Explain the difference between operating income and net income.
 - 13 Define financial leverage and explain why it is used.
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RATIO ANALYSIS

Ratio analysis in the simplest terms is the comparison of two figures, numerical dollar values or quantity values. Ratio analysis allows an evaluation of balance sheet items in conjunction with some income statement information to determine various relationships between selected items. We have already discussed two basic types of ratio analysis in Chapter 2—comparative horizontal and common-size vertical analysis of balance sheets and income statements. Comparative analysis finds the numerical change and expresses the numerical change as a percentage. Common-size analysis expresses each item as a percentage of total sales revenue for the income statement and total assets for the balance sheet.

Ratios can express relationships as a percentage, a numerical value, a quantity, or on a per-unit basis. Ratios are fractions where the numerator is expressed as a portion of the denominator. For example, assume sales revenue for a given month was \$48,000 and cost of sales was \$19,200. If we want to know what cost of sales is as a percentage of sales revenue, the calculation is

$$\text{Cost of sales} / \text{Sales revenue} = \$19,200 / \$48,000 = \underline{\underline{40.0\%}}$$

If we know total current assets is \$5,000 and total current liabilities is \$2,000 and we want to find the relationship of total current assets to total current

liabilities as of a specific date, two calculations can be made based on the same information:

$$\text{Total current assets} / \text{Total current liabilities} = \$5,000 / \$2,000 = \underline{\underline{2.5:1}}$$

or

$$\text{Total current liabilities} / \text{Total current assets} = \$2,000 / \$5,000 = \underline{\underline{40.0\%}}$$

The first ratio tells us that total current assets are 2.5 times greater than total current liabilities; in essence, there is \$2.50 in current assets for each \$1.00 of current liabilities. The second ratio expresses total current liabilities as 40 percent of total current assets. The way a ratio is expressed is dependent on the format that will best describe the relationship between two figures and on the information available.

It is important to remember that when two figures are converted to a ratio, the relationship between the two figures must be realistic, meaningful, and understandable. If we compare cost of sales—food to the sales revenue food produced, the ratio analysis would be realistic, meaningful, and understandable. Certainly this would not be the case if food cost of sales were compared to management salaries, as no useful information is provided.

RATIO COMPARISONS

Ratios are used to help a business entity evaluate financial and economic results of profit-oriented operations over a given accounting period. A ratio standing alone is simply a number and appears to have little value, in that the ratio does not directly show favorable or unfavorable results. For example, a restaurant's food inventory turnover of four times per month may appear good, but until the turnover ratio is compared with some standard, such as the average turnover ratio in the restaurant industry for that type of restaurant, its true value cannot be determined.

For a ratio to have meaning, it must be comparable to a standard or an established base ratio. A standard ratio could be an industry average, but such a standard ratio may be the least valuable. Industry standards are generally developed through information received from hospitality organizations having the same type of activities; however, such establishments may be spread over a large geographic area. Different operating conditions prevail in different locations within the geographical area (e.g., average family income, salaries, hourly pay rates, and cost of living levels, and disposable income). As a result of such economic variances across a geographical area, there may not be one operation that is just like the "average operation" from which the standard ratios are determined. Industry averages are good for telling a manager if the operation is "in the ballpark" with the industry but should not be used as the operation's standard.

Another method of ratio comparison may use comparable ratios from similar competitive organizations. Obtaining competitive ratios may prove difficult, if not impossible. If competitive ratios are available and they differ when compared to the ratios of your operation, which ratios are better? There are many reasons that may explain the differences in individual ratios between competitors.

A better technique is to compare current operating period ratios with previous operating period ratios. For example, how does current room occupancy or seat turnover ratio compare with the same ratio from the previous month, or the previous year? What is the trend? Is room occupancy or seat turnover increasing, or is room occupancy or seat turnover decreasing. How do you determine if the difference in the ratio is appropriate or inappropriate? Even with limited exposure, one soon discovers that a hospitality business operates in a dynamic and rapidly changing environment. Therefore, comparison of current period ratios to past period ratios may be like comparing copper to gold.

The best method of ratio comparison is to evaluate current period ratios to predetermined standards for that operating period. The predetermined standard should consider both internal and external factors affecting the operation. Internal factors might include the composition of sales revenue (cash versus credit sales), fixed and variable costs, internal operating policies, changes in operating procedures, and many other similar operating variables. External factors might include general economic conditions and what the competition is doing.

Periodic predetermined operating standards can be used to develop operating plans to assist in developing the annual operating budget (forecasted income statement). The operating budget can be broken down into monthly or quarterly operating periods, which are adjusted for seasonal variations. Operating budgets should project future operations based not only on past operating results but also on current operating results. Budgeting is an important and time-sensitive management skill and is discussed in depth in Chapter 9.

USERS OF RATIOS

Generally, three broad groups of people are interested in the evaluation of ratios: internal operating management, current and potential creditors, and the organization's owners. A proprietorship has one owner, a partnership has two or more owners, and a corporation normally has a number of owners called stockholders or shareholders.

Management has the responsibility of safeguarding the assets, controlling costs, and maximizing profit for the business operation. Ratio evaluation is a major technique used by management to monitor the operation's performance against predetermined standards to determine if the operating budget objectives are being achieved. Certain ratios are used to evaluate the effectiveness of day-to-day operations, to assess its current liquidity position, and to assess other economic positions that define certain objectives to satisfy owners as well as

creditors. A number of different ratios used by management to evaluate whether the performance objectives are being achieved are discussed in this chapter.

Creditors of a business operation have an equity claim to the assets of the operation that is shown as the liabilities element of the basic balance sheet equation $A = L + OE$. Creditors loan money or extend trade credit to the business operation. As such, creditors are normally interested in certain ratios that may indicate the level of safety of their loaned funds or trade credit. In addition, existing and potential creditors use certain ratios to estimate their potential risk of future loans the business operation may need. In some cases, a creditor may require the borrower to maintain a specified level of working capital, a specific level of current assets greater than current liabilities.

Last but not least, the ownership of a business operation can use certain ratios to measure such items as their return on investment, the risk level of their investment, or to estimate the probability of success of future operations.

In many cases, members of the three groups interested in the evaluation of ratios will not agree on what a particular ratio means. This is to be expected since each group interprets the ratio from a different perspective.

RATIO CATEGORIES

Ratio analysis will be discussed in the following five major categories using information from Exhibit 4.1, annual balance sheets for Years 0003 and 0004, and Exhibit 4.2, condensed income statement for the year ended December 31, 0004:

- *Current liquidity ratios.* The primary purpose of **liquidity ratios** is to identify the relationship between current assets and current liabilities; thus, liquidity ratios provide the basis for an evaluation of the ability of a company to meet its current obligations. Liquidity ratios that provide a direct analysis of current and quick assets in relation to current liabilities are the **current ratio** (or the **working capital ratio**) and the **quick ratio** (or **acid test ratio**). The analysis of credit sales provides an analysis of the average time that elapses between the creation and collection of current receivables. Typical ratios concerning receivables are the credit card receivables turnover; credit card receivables as a percentage of net credit sales; credit cards average collection period; accounts receivable turnover; accounts receivable as a percentage of net credit sales; and accounts receivable average collection period.
- *Profitability ratios.* Resources and assets are made available to management to conduct sales-revenue-generating operations, and the profitability ratios show management's effectiveness in using the resources (assets) during operating periods. Profitability ratios to be discussed are return on assets, profit to sales ratio, return on ownership equity, return on total investment, and earnings per share.

	<i>Year Ending December 31</i>	
	<i>Year 0003</i>	<i>Year 0004</i>
<i>Assets</i>		
<i>Current Assets</i>		
Cash	\$ 18,500	\$ 29,400
Credit card receivables	9,807	11,208
Accounts receivable	5,983	6,882
Marketable securities	15,400	2,000
Inventories	12,880	14,700
Prepaid expenses	10,800	14,900
<i>Total Current Assets</i>	<u>\$ 73,370</u>	<u>\$ 79,090</u>
<i>Property Plant & Equipment</i>		
Land	\$ 60,500	\$ 60,500
Building	828,400	884,400
Equipment	114,900	157,900
Furnishings	75,730	81,110
Net: Accumulated depreciation	(330,100)	(422,000)
China, glass, silver, & linen	16,600	18,300
<i>Total Property, Plant & Equipment</i>	<u>\$766,030</u>	<u>\$780,210</u>
Total Assets	<u>\$839,400</u>	<u>\$859,300</u>
<i>Liabilities & Stockholders' Equity</i>		
<i>Current Liabilities</i>		
Accounts payable	\$ 19,200	\$ 16,500
Accrued expenses payable	4,200	5,000
Taxes payable	12,400	20,900
Current mortgage payable	26,900	26,000
<i>Total Current Liabilities</i>	<u>\$ 62,700</u>	<u>\$ 68,400</u>
<i>Long-term liabilities</i>		
Mortgage payable	\$512,800	\$486,800
Total Liabilities	<u>\$575,500</u>	<u>\$555,200</u>
<i>Stockholders' Equity</i>		
Common stock (\$5 par. 40,000 shares issued & OS)	\$200,000	\$200,000
Retained earnings	63,900	104,100
<i>Total Stockholders' Equity</i>	<u>\$263,900</u>	<u>\$304,100</u>
Total Liabilities & Stockholders' Equity	<u>\$839,400</u>	<u>\$859,300</u>

EXHIBIT 4.1

Annual Balance Sheets for the Years Ending December 31, 0003 and 0004

- *Long-term solvency ratios.* These ratios are also called net worth ratios, and they measure a company's ability to meet its long-term debt repayment responsibilities. Included are ratios that describe total assets to total liabilities, total liabilities to total assets, total liabilities to total ownership equity, cash flow from operating activities to total liabilities,

Revenue	
Sales revenue*	\$1,175,200
Cost of sales	(394,800)
Gross Margin	\$ 780,400
Direct Operating Expenses	
Payroll expenses	\$305,100
Other expenses	<u>117,300</u>
Total Direct Operating Expenses	(422,400)
Operating Income	\$ 358,000
Undistributed Operating Expenses	
Administrative and general expenses	\$ 60,280
Marketing expenses	17,088
Property operation and maintenance	27,222
Energy expenses	<u>21,100</u>
Total Undistributed Operating Expense	(125,690)
Income before fixed expenses	\$ 232,310
Property taxes	\$ 43,334
Insurance expense	11,750
Depreciation expense	<u>82,064</u>
Total Fixed Expenses	(137,148)
Income Before Interest and Income Tax	\$ 95,162
Interest expense	(26,044)
Income before income tax	\$ 69,118
Income tax (@ 32%)	(22,118)
Net Income	<u>\$ 47,000</u>

*Total sales revenue on average consisted of 28% cash sales, 62% credit card sales, and 10% accounts receivable.

EXHIBIT 4.2

Condensed Income Statement (Year Ended December 31, 0004)

cash flow from operating activities to interest, and the number of times interest is earned.

- **Activity ratios.** Activity or turnover ratios indicate how well the managers are using assets. Inventory turnover ratio shows the relationship between inventories held for resale and the cost of sales over an operating period. In addition, the average days of inventory for resale on hand can be determined. Working capital turnover that measures the effectiveness of using working capital and fixed asset turnover that measures the effectiveness of using fixed assets are also explained.
- **Operating ratios.** The final category to be discussed includes analysis of items that are oriented primarily to food, beverage, and rooms operations. Operating ratios are generally summarized on the manager's daily or

weekly report. This chapter concludes with a discussion on financial leverage, or, simply put, the use of debt to obtain capital. Basically, there are two sources of obtaining operating capital—assuming long-term debt or increasing ownership equity by selling additional ownership rights. **Financial leverage** is the term used to describe the use of debt, rather than equity financing to increase the return on ownership equity.

Ratios are categorized only for convenience. For example, some people might classify working capital turnover as a current liquidity ratio, whereas in this chapter it is included among the activity ratios. It is important to understand the ratio's meaning and how a ratio can be interpreted rather than its category. This analysis requires determining the reasons that caused a ratio to not be what was expected. Individual ratios normally provide information about one aspect of a business operation, whereas the analysis and interpretation of several ratios jointly will yield a more comprehensive view of a business operation than a single ratio or financial statements alone.

CURRENT LIQUIDITY RATIOS

Current liquidity ratios, or sometimes just called liquidity ratios, indicate the ability of an operation to meet its short-term obligations for the repayment of debt without difficulty. A business's operating income statement may show operating income (before taxes) or a net income (after taxes) without the business operation having the ability to pay its current liabilities, let alone its long-term debt obligations. This situation is discussed and demonstrated in Chapter 11, which discusses cash management. In particular, the reader is referred to the section on cash conservation and working capital management discussed in that chapter. At this point, we will turn our attention to some of the current liquidity ratios that indicate the effectiveness of working capital management. **Working capital** is the difference between current assets and current liabilities ($CA - CL$).

CURRENT RATIO

The most commonly used ratio to express current liquidity is the *current ratio*. This ratio shows the ability of an operation to pay its short-term debts, which are classified as current liabilities. The current ratio is:

Current assets / Current liabilities

The calculation for Year 0003 in Exhibit 4.1 is:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$73,370}{\$62,700} = \underline{\underline{1.17:1}}$$

The calculation for Year 0004 is:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$79,090}{\$68,400} = \underline{\underline{1.16:1}}$$

The ratio for Year 0004 from Exhibit 4.1 shows \$1.16 of current assets is available for every \$1.00 of current short-term debt (current liabilities). In general, a rule of thumb exists that current assets should exceed current liabilities on a ratio of two to one, which implies \$2.00 of current assets exists for each \$1.00 of current liabilities. However, this general rule was set to provide a safety margin for operations that normally have a portion of its current assets tied up in inventories, e.g., manufacturing operations and other processing operations. In the hospitality industry, the largest inventories held by a hotel and motel operation is in the form of guest rooms available for sale, and these are included under building, which is a part of fixed assets as property, plant, and equipment. The only current inventories (inventories for resale) held for resale by hotel-motel operations are for food and beverage services, and these current inventories represent a rather small portion of current assets.

Therefore, hotels can operate with a current ratio of 1.5 or less; motels and restaurants have shown that they can operate on a current ratio of less than 1 to 1. For each individual hospitality operation, a minimum ratio must be determined. The minimum ratio will be one that does not create a short-term liquidity problem or sacrifice profitability. Money tied up in working capital is money that is not being used to earn income.

Creditors and potential creditors prefer to see a high ratio of current assets to liabilities, since it provides a positive indicator of a business operation's capability to repay its debt obligations. Many creditors require a minimum current ratio before funds are loaned or credit is extended. Once a loan or credit is extended, the creditor may require that a minimum current ratio be maintained. If a minimum current ratio is required and the current ratio falls below the required level, the creditor might demand immediate payment in full on any balance outstanding.

The opposite is true for owners, who normally prefer a low ratio of current assets to current liabilities, since a high ratio may indicate more money is tied up in working capital and not being used efficiently. Owners might be concerned that on-hand inventories for resale might exceed anticipated needs and, as such, will increase the cost of holding inventory. Owners might also be concerned that receivables not being collected as quickly as they should be. Management of the operation must try to maintain a current ratio that is acceptable to both ownership and creditors—a task not easily achieved.

It is possible to change the current ratio to make it appear better than it really is. Exhibit 4.3 presents the current asset and current liability sections for Year 0003 of the balance sheet shown in Exhibit 4.1. If \$20,000 in cash were used just prior to the end of an accounting period to reduce accounts payable

<i>Current Assets</i>		<i>Current Liabilities</i>	
Cash	\$29,400		
Credit card receivables	11,208		
Accounts receivable	6,882	Accounts payable	\$16,500
Marketable securities	2,000	Accrued expenses	5,000
Inventories	14,700	Taxes payable	20,900
Prepaid expenses	14,900	Current mortgage payable	26,000
	<u>\$79,090</u>		<u>\$68,400</u>
Working Capital: $CA - CL = \$79,090 - \$68,400 = \underline{\underline{\$10,690}}$			

EXHIBIT 4.3

Current Balance Sheet Section for Year 0004

by \$10,000 and taxes payable were also reduced by \$10,000, the adjustment shown in Exhibit 4.4 will create a higher current ratio.

The comparable current ratios would be:

$$\text{Exhibit 4.3: } CA / CL = \$79,090 / \$68,400 = \underline{\underline{1.16:1}}$$

$$\text{Exhibit 4.4: } CA / CL = \$59,090 / \$48,400 = \underline{\underline{1.22:1}}$$

In this case, the change is small and not very significant, but in other cases, the change may be large and have a significant effect on disguising the status of working capital. When the current ratio is changed in this manner, the working capital does not change. This form of manipulation is referred to as *window dressing*. However, if accounts payable of \$15,000 were due, there would be no

<i>Current Assets</i>		<i>Current Liabilities</i>	
Cash	\$ 9,400		
Credit card receivables	11,208		
Accounts receivable	6,882	Accounts payable	\$ 6,500
Marketable securities	2,000	Accrued expenses	5,000
Inventories	14,700	Taxes payable	10,900
Prepaid expenses	14,900	Current mortgage payable	26,000
	<u>\$59,090</u>		<u>\$48,400</u>
Working Capital: $CA - CL = \$59,090 - \$48,400 = \underline{\underline{\$10,690}}$			

EXHIBIT 4.4

Current Balance Sheet Sections Modified for Year 0004

harm in paying them off in the manner illustrated. Reducing the payables to improve the current ratio makes good sense if the business anticipates the need for short-term financing in the immediate future. Other reasonable methods of window dressing include borrowing a long-term payable or obtaining additional ownership investments. Another option would be to sell physical property, plant, and equipment assets that are no longer needed to convert them to cash.

COMPOSITION OF CURRENT ASSETS

We can assess the change in the current liquidity of the operation by using common-size vertical analysis on the current assets using the techniques discussed in Chapter 3. Any subset of a financial statement such as total current assets can be analyzed to show the percentage relationship of each item within the subset.

The current asset sections of Exhibit 4.1, for Years 0003 and 0004, are shown in Exhibit 4.5 in a common-size vertical analysis format. The exhibit shows the change in the proportion of the current assets over a two-year period.

Exhibit 4.5 shows that cash as a percentage of total current assets changed from 25.2 percent in Year 0003 to 37.2 percent in Year 0004. However, the most liquid current assets of cash, receivables, and marketable securities have decreased in total from 67.8 percent (25.2% + 13.4% + 8.2% + 21.0%) in Year 0003, to 62.6 percent (37.2% + 14.2% + 8.7% + 2.5%) in Year 0004. The cash position has improved, but the total of the four most liquid assets has declined. The major item causing the decline was selling the marketable securities during Year 0003 to reduce current liabilities and increase the current ratio. These most liquid current assets are often classified as **quick assets**.

<i>Current Assets</i>	<i>Year 0003</i>		<i>Year 0004</i>	
	<i>Amount</i>	<i>Percent</i>	<i>Amount</i>	<i>Percent</i>
Cash	\$18,500	25.2%	\$29,400	37.2%
Credit card receivables	9,807	13.4	11,208	14.2
Accounts receivable	5,983	8.2	6,882	8.7
Marketable securities	15,400	21.0	2,000	2.5
Inventories	12,880	17.6	14,700	18.6
Prepaid expenses	10,800	14.7	14,900	18.8
	<u>\$73,370</u>	<u>100%</u>	<u>\$79,090</u>	<u>100%</u>

EXHIBIT 4.5

Changes in the Proportion of Current Assets

QUICK RATIO (ACID TEST RATIO)

The quick ratio, also called the acid test ratio, uses an extreme view of liquidity since it only uses current assets that can be readily converted to cash if the need should arise. Current assets that are considered readily convertible to cash are called quick assets and will not include current assets such as inventories, prepaid expenses, and other nonliquid assets. The quick ratio is calculated using the current asset and current liability information shown in Exhibit 4.1.

The quick ratio for Year 0003:

$$\frac{\text{Cash} + \text{Credit card receivables} + \text{Accounts receivable} + \text{Marketable securities}}{\text{Total current liabilities}} = \frac{\$18,500 + \$9,807 + \$5,983 + \$15,400}{\$62,700} = \frac{\$49,690}{\$62,700} = \underline{\underline{0.79:1}}$$

The quick ratio for Year 0004:

$$\frac{\$29,400 + \$11,208 + \$6,882 + \$2,000}{\$68,400} = \frac{\$49,490}{\$68,400} = \underline{\underline{0.72:1}}$$

An alternative method to find the quick ratio is expressed as:

$$\frac{\text{Total current assets} - \text{Inventories} - \text{Prepaid expenses}}{\text{Current liabilities}}$$

$$\text{Quick ratio, Year 0004: } \$79,090 - \$14,700 - \$14,900 = \$49,490 / \$68,400 = \underline{\underline{0.72:1}}$$

The quick ratio for Year 0003 is 0.79:1, showing there is \$0.79 of quick assets for every \$1.00 of current liabilities. In Year 0004, the quick ratio has fallen to 0.72:1, showing only \$0.72 of quick assets to every \$1.00 of current liabilities. This tells us that the most liquid current assets are below a dollar-to-dollar ratio, which is generally considered as the low end of the safety range for the quick ratio. These low quick ratios indicate a large value of nonliquid current assets that normally consist of inventories for resale and prepaid expenses. Prepaid expenses are nonliquid since prepaid expenses are consumed over the period of time they provide benefits and generally cannot be converted to cash. However, removing inventories for resale in the hotel, food, and beverage industry may be questionable, since inventories of food and beverages turn over in days rather than months as they do in manufacturing businesses. Since inventories for resale are turned over quickly and converted to sales revenue that is recognized as cash and receivables that will be collected as cash within days—or at the most within a week or so, it might be appropriate to include inventories for resale as liquid assets.

The exclusion of inventories may be valid in some industries, where the nature of their business requires inventory availability for periods of months or more. Since the major difference in the current and quick ratios is inventory, some hospitality operations such as a motel without a food or beverage operation may see little variance between the two ratios.

Creditors, owners, and managers analyze and interpret the quick ratio the same way they analyze and interpret the current ratio. Creditors still prefer to see a high ratio, owners prefer a low ratio, and management must continue to maintain a balance between the creditors' and owners' viewpoints.

RECEIVABLE RATIOS

To provide the most accurate evaluation on an annual, monthly, quarterly, or semiannual basis, total sales revenue should be broken into three components: cash, credit card receivables, and accounts receivable from sales revenue. To correctly calculate receivable ratios, at least two successive periods of data is required.

Operations should know how much of their sales revenues are cash, accounts receivable, and credit card receivables because they will have to record each of these in the appropriate accounts so they know how much they have to collect.

The most accurate method of determining a receivable ratio is one that evaluates each individual receivable in relation to the type of credit sales produced. If credit card receivables and accounts receivable are not maintained by subsidiary accounts within the total sales revenue figure, the second best alternative is to maintain total sales that are shown to consist of cash plus credit sales. This alternative will skew receivable ratios since reported credit sales will consist of two different components—credit cards and accounts receivable. The next alternative is to simply use total sales revenue to evaluate receivable ratios; however, the skewing of the ratios will increase because total sales revenue will not show any categories for credit sales. The last but not worst alternative is to rely on past historical percentages of credit sales by category to evaluate receivable ratios. The ever-present danger in using historical information is that the ratio of current cash to credit sales may have changed.

Credit card sales are the major portion of sales revenue in the hospitality industry today and should not be ignored as a current receivable to be evaluated. Normally, major large hospitality organizations are computerized with fully automated accounting systems that are capable of immediately accessing any ratios they choose to review. However, this is not particularly true for smaller operations that may not have the online computerized resources of a larger organization. Credit card sales revenue is a near-cash transaction due to quick reimbursement by the credit card company. Collections of credit card receivables normally range from 1.5 to 5.0 operating days. Depending on the volume of credit card sales and the efficiency of credit card companies, the turnover rate

for credit card receivables on average may vary from 243 to 73 times per annual operating period.

The collection period varies with the type of card. As well, larger hospitality operations that are tied electronically online with a card-clearing center are reimbursed at the time of sale or on the same day that the credit card sale is made. A discount of 1.5 to 5.0 percent is charged by credit card companies. The variances in the discount rate may depend on the volume of credit card sales, the size and type of organization, and/or a negotiated rate. The discount rates charged and the average credit card collection period are two major items affecting cash flows.

If customers use debit cards to pay for their purchases, the customers' bank accounts are charged at the time of the sale and the money is transferred to the operation's bank account. The nature and speed of the reimbursement classifies the use of a debit card as a cash sale.

Although credit card use continues to increase and the use of accounts receivable (trade credit) continues to decrease, accounts receivable will continue to be used in private clubs, for corporate organizations, for special food and beverage functions (banquets), and in other hospitality areas where the use of accounts receivable is considered appropriate.

As discussed earlier, if accounts receivable is calculated based on total sales revenue, the ratio is skewed because total sales revenue is used rather than credit sales revenue. The skewing effect has continued because of failure to recognize the increase of credit card sales revenue that has added a second component to credit sales. This skewing effect, if unnoticed, may increase steadily for years and the manager may not notice that collection periods are too long.

As the percentage of credit card sales increases beyond 50 to 60 percent of total credit sales, it may become prudent to integrate credit card sales under the general classification of accounts receivable. In general, credit card receivables can be integrated into the accounts receivable classification by using subsidiary accounts receivables, which identify each credit card accepted by name—Visa, MasterCard, and so on. The same technique of using subsidiary accounts to identify a person or company that has been extended trade credit should be in place.

The following sections discuss and illustrate the basic methods used (except historical data) to determine various ratios applicable to credit receivables. We will begin with credit card receivables, followed by accounts receivable. The discussion of credit card receivables as a separate classification of credit sales is designed to stress the importance and effect of this classification of credit sales. The potential skewing effects of an operating receivable ratio will become apparent, as each receivable ratio is discussed for credit card sales, accounts receivable credit sales, total credit sales, and total sales revenue. Although receivable ratios may be evaluated on an annual, semiannual, quarterly, or monthly basis, only the annual basis is discussed and illustrated.

CREDIT CARD RECEIVABLES RATIOS

Credit card receivables ratios will be discussed as a percentage of total credit card revenue, total credit revenue, and total sales revenue. The ratios will be discussed in the following sequence:

- Credit card receivables ratios based on credit card revenue, total credit revenue, and total sales revenue
- Credit card receivables turnover ratios
- Credit card receivables average collection periods

The information used to calculate each of the following ratios is extracted from Exhibit 4.1 and Exhibit 4.2. Total sales revenue: \$1,175,200 with cash sales of 28% or \$329,056, credit card sales of 62% or \$728,624, and accounts receivable sales of 10% or \$117,520.

Credit Card Receivables as a Percentage of Credit Card Revenue, Total Credit Revenue, and Total Sales Revenue

This ratio will show the relationship of credit card receivables to credit card revenue, which is the most accurate method:

$$\frac{(\text{Beginning credit card receivables} + \text{Ending credit card receivables})}{2} = \text{Average credit card receivables}$$

$$(\$9,807 + \$11,208) / 2 = \$21,015 / 2 = \underline{\underline{\$10,508}}$$

The calculation:

$$\frac{\text{Average credit card receivables}}{\text{Total credit card revenue}} = \frac{\$10,508}{\$728,624} = \underline{\underline{1.4\%}}$$

This ratio defines credit card receivables remaining uncollected on a given day of operations; it averages only 1.4 percent of total credit card sales. In addition, this low percentage of average credit card receivables indicates an apparent short collection period for credit card receivables. In our example, credit card sales represent 62 percent of total credit revenue; thus, \$0.62 of each dollar of sales revenue is generated through credit card sales. This method also allows the determination of monthly average credit card receivables for a seasonal operation.

The equation to show only the relationship of average credit card receivables as a percentage of total *credit* revenue is

$$\text{Average credit card receivables} / \text{Total credit revenue}$$

$$\frac{\$10,508}{\$846,144} = \underline{\underline{1.2\%}}$$

By combining all credit sales regardless of category into a single sum of total credit revenue, the original estimate of credit card receivables has decreased from 1.4 percent of total credit card sales to 1.2 percent of total credit sales because of the inclusion of accounts receivable revenue of \$117,520. However, the example showing credit card receivables evaluated as a percentage of total credit sales fails to recognize that credit card sales are \$0.62 per dollar of sales revenue.

By not discriminating differences between credit card sales revenue and accounts receivable sales revenue, the skewing effect is further amplified that prevents the determination of an accurate estimate of all categories of receivables created by credit sales.

The ultimate skewing of credit card receivables occurs when any reference to credit sales is omitted from the calculation. The ratio to express credit card receivables as a percentage of total revenue, which excludes both forms of credit revenue, is

Average credit card receivables / Total sales revenue

$$\frac{\$10,508}{\$1,175,200} = \underline{\underline{0.9\%}}$$

In the calculation above, the sources of credit revenue that total 72 percent of revenue (62 percent credit card and 10 percent accounts receivable) have been eliminated. The percentage credit card receivables and accounts receivable based on total credit revenue or total revenue is less accurate and less meaningful. Use of average credit card receivables as a percentage of credit card revenue rather than total credit revenue or total sales revenue provides the most accurate and meaningful results.

Credit Card Receivables Turnover Ratios

The turnover ratio expresses the relationship of credit card revenue to average credit card receivables as the inverse of the previous ratio. The credit card receivables turnover ratio describes the average number of times during an annual operating period that the repetitive cycle of credit card sales and their reimbursement occurred. As with the ratio previously discussed, the operating period can be changed to monthly, quarterly, or annual to calculate this ratio: The ratio doesn't change for monthly, quarterly, or annual calculations; just the figure changes. The equation is on the next page.

The skewing continues and is easily apparent. The correct turnover ratio for credit card receivables is 69.3 times per year; however, if total credit sales revenue or total sales revenue were used, the turnover ratio increases to 80.5 times per year and 111.8 times per year, respectively. The average credit card collection period will convert the annual turnover ratios from times per year to the number of days for the average collection of credit card receivables.

Total credit card revenue / Average credit card receivables

$$\text{The calculation: } \frac{\text{Total credit card revenue}}{\text{Average credit card receivables}} = \frac{\$728,624}{\$10,508} = \underline{\underline{69.3}} \text{ times}$$

If only total credit sales revenue is available, the equation is modified to

Total credit revenue / Average credit card receivables

$$\text{The calculation: } \frac{\text{Total credit revenue}}{\text{Average credit card receivables}} = \frac{\$846,144}{\$10,508} = \underline{\underline{80.5}} \text{ times}$$

If only total sales revenue is available, the equation is modified to:

Total sales revenue / Average credit card receivables

$$\text{The calculation: } \frac{\text{Total sales revenue}}{\text{Average credit card receivables}} = \frac{\$1,175,200}{\$10,508} = \underline{\underline{111.8}} \text{ times}$$

Average Credit Cards Collection Period

This ratio uses the credit card turnover ratio to create an understandable correlation to the repetitive cycle of credit card sales and the collection of credit card receivables over an annual operating period in days. In essence, this collection ratio tells us the average number of days it is taking to collect on credit card receivables.

The equation to calculate the annual average credit card collection period, when credit sales revenue is used, is

365 days / Credit card receivables turnover ratio

To calculate the average credit card collection period for a month or a quarter, the equation is:

[Days in the period / Credit card receivables turnover ratio for the period]

$$\text{The annual calculation: } \frac{365}{69.3} = \underline{\underline{5.3}} \text{ days}$$

Comparing the average collection period based on credit sales revenue and total sales revenue shows the skewing effect.

Based on credit revenue:

$$\text{The calculation: } \frac{365 \text{ days}}{\text{Credit card turnover ratio}} = \frac{365}{80.5} = \underline{\underline{4.5}} \text{ days}$$

Based on total revenue:

$$\text{The calculation: } \frac{365 \text{ days}}{\text{Credit card turnover ratio}} = \frac{365}{111.8} = \underline{\underline{3.3}} \text{ days}$$

Another method to calculate the annual credit card receivables collection period is

(Average credit card receivables / Total credit card sales revenue) \times 365 days

$$\text{The calculation: } (\$10,508 / \$728,624) = 1.44\% \times 365 = \underline{\underline{5.3}} \text{ days}$$

The credit card collection period indicates the average number of days to collect credit card receivables from credit card companies. As discussed earlier, the collection period generally ranges from 1.5 to 5 days and should average 2.5 days. It is wise to set up subsidiary accounts for each card company that will identify which companies are not paying within the average of 2 to 3 days. It is wise to determine the average days taken by each credit card accepted. It would not be unusual to find that at least one credit card company is taking from 8 to 10 days to reimburse.

ACCOUNTS RECEIVABLE RATIOS

Although accounts receivable is decreasing due to increasing use of credit cards, they will continue to be used. Our discussion of accounts receivable ratios will follow the same approach used for credit card ratios. The skewing effect shown for credit card receivables will also apply to accounts receivable; however, they will not be illustrated in depth for accounts receivable. The three basic ratios that analyze accounts receivable use average accounts receivable and accounts receivable revenue.

- Accounts receivable as a percentage of accounts receivable credit revenue
- Accounts receivable turnover
- Accounts receivable average collection period

Accounts Receivable as a Percentage of Accounts Receivable Credit Revenue

This ratio is best expressed as accounts receivable as a percentage of accounts receivable credit revenue. Normally this ratio provides information on an annual operating period, but can also be used for monthly, quarterly, and semiannual periods to evaluate accounts receivable. If cash and credit card and accounts receivable credit sales are not maintained separately within the total

sales revenue figure, a historical percentage of credit sales to total sales revenue may be used. However, use of historical information is a last alternative since historical information may easily produce inaccurate results since the relationship between cash, credit card, and accounts receivable revenue may have changed. Thus, the ratios will produce the best and most accurate evaluation of average accounts receivable if accounts receivable credit revenue is used.

The values in Exhibit 4.1 and Exhibit 4.2 are used in the discussion of accounts receivable ratios. The equation to find accounts receivable as a percentage of accounts receivable credit revenue is

$$\begin{aligned} & \text{(Beginning accounts receivable + Ending accounts receivable) / 2} \\ & \quad = \text{Average accounts receivable} \\ & \quad (\$5,983 + \$6,882) / 2 = \$12,865 / 2 = \underline{\underline{\$6,433}} \end{aligned}$$

The calculation:

$$\frac{\text{Average accounts receivables}}{\text{Accounts receivable credit revenue}} = \frac{\$6,433}{\$117,520} = \underline{\underline{5.5\%}}$$

The ratio tells us that over the year an average of 5.5 percent of accounts receivable credit revenue was in the form of accounts receivable during any given day of operations. In a drive-in, cash-only operation, this ratio would obviously be 0 percent. If a private club permits only internal charge transactions with members being billed monthly, accounts receivable as a percentage of revenue could range from 10 to 20 percent. In a typical hotel or restaurant operation, some customers will pay cash, the majority will pay by credit card, and a few customers may have access to a house account or accounts receivable. While credit card use may easily represent 40 to 70 percent of total revenue, house accounts or accounts receivable could represent 4 to 10 percent of total revenue. These figures represent industry averages, but an organization should be most concerned with information regarding existing trends within its own operation, not a comparison with industry averages.

The procedure discussed on an annual basis uses the beginning accounts receivable plus the ending accounts receivable, divided by 2. Earlier, we discussed the best method for a seasonal operation with highly fluctuating revenue. Adding each month's accounts receivable and dividing by 12 months may best calculate the annual average accounts receivable. Average accounts receivable can also be calculated on a monthly, quarterly, or semiannual basis. Though far from being the best method, an annual ratio could be calculated using total credit revenue or total sales revenue rather than accounts receivable credit revenue. If one of these methods is used, the ratios will be skewed and will not produce the best results, as shown below. Use of total credit revenue or total revenue should be avoided if at all possible.

Average accounts receivable / Total credit revenue

$$\frac{\$6,433}{\$846,144} = \underline{\underline{0.8\%}}$$

Average accounts receivable / Total sales revenue

$$\frac{\$6,433}{\$1,175,200} = \underline{\underline{0.5\%}}$$

In a cash-only operation, it is obvious that accounts receivable would not exist. On the other hand, for a private club that permits only credit charge transactions, billing each member at the month-end, the accounts receivable as a percentage of sales revenue may be as high as 10 to 12 percent. Updated industry averages exist, but what is most important is the trend of the figures within hospitality operations. The use of either total credit sales revenue or total sales revenue will show the percentage of credit card receivables on any given day of operations over the operating year. However, the use of credit sales rather than total sales provides the best and most accurate results.

Note the calculation of average accounts receivable uses the same method that was used to find average credit card receivables—beginning accounts receivable plus ending accounts receivable divided by 2. Also note that using the information in Exhibits 4.1 and 4.2, you can only calculate the accounts receivable ratios for Year 0004.

Accounts Receivable Turnover

The accounts receivable turnover ratio equation reverses the previous equation. The equation is:

Total credit revenue / Average accounts receivable

The calculation:

$$\frac{\text{Average receivable credit revenue}}{\text{Average accounts receivable}} = \frac{\$117,520}{\$6,433} = \underline{\underline{18.3 \text{ times}}}$$

Depending on the volume of accounts receivable, credit sales, and the efficiency of accounts receivable collections, this turnover ratio could vary from 10 to 30 times per year. If this ratio used total credit sales or total sales, the ratio would be highly skewed as demonstrated earlier. Although it might be difficult to conceptualize the meaning of times per year, this ratio is necessary to calculate an average collection period in days.

Accounts Receivable Average Collection Period

The equation to calculate the accounts receivable average collection period is

$$\text{Days in the period} / \text{Accounts receivable turnover ratio for the period}$$

The annual calculation:

$$\frac{365 \text{ days}}{\text{Accounts receivable turnover ratio}} = \frac{365}{18.3} = \underline{\underline{19.9 \text{ days}}}$$

The lower the collection period, the more efficient the ability to collect accounts receivable within the business operation. An operation that extends 30-day accounts receivable credit could expect to see an average collection period of 30 to 35 days. An operation extending 15-day accounts receivable credit could see an average collection period of 15 to 20 days. However, if the collection period is 10 days or more beyond the number of days credit is granted, the operation should become concerned and should review its credit collection procedures and reevaluate its credit policies.

To reiterate, the discussion of credit card receivables has emphasized the use of credit card receivable revenue rather than total credit or total revenue to produce the best and most accurate results. Examples were shown where total credit revenue and total revenue replaced credit card and accounts receivable revenues. This resulted in skewed ratios, and the skewing was obvious. This skewing will also occur with accounts receivables ratios.

In general, owners and creditors prefer to see a low average collection period or a high turnover ratio on all credit receivables. On the other hand, management prefers a higher average collection period and a lower turnover period as long as the ratios are within or close to the number of days allowed.

LONG-TERM SOLVENCY RATIOS

Solvency ratios are sometimes referred to as **net worth ratios**. Solvency is defined as total tangible assets, that is, total assets excluding nontangible items such as goodwill, less total liabilities. In other words, solvency is usually the same as total stockholders' equity (assuming no intangible assets). Total assets in any business can be financed primarily by either assuming debt (liabilities) or through ownership equity (shares and retained earnings). Solvency ratios show the balance between these two methods of financing. There are three main solvency ratios, each showing this balance in a different way. These three ratios are total assets to total liabilities ratio, total liabilities to total assets ratio, and total liabilities to total stockholders' equity ratio. We need three figures from each year's balance sheet to calculate these ratios.

<i>[A = L + OE]</i>	<i>Year 0003</i>	<i>Year 0004</i>
Total assets	\$839,400	\$859,300
Total liabilities	575,500	555,200
Total equity	263,900	304,100

TOTAL ASSETS TO TOTAL LIABILITIES RATIO

The total assets to total liabilities ratio is

Total assets / Total liabilities

$$\text{The calculation, Year 0003: } \frac{\$839,400}{\$575,500} = \underline{\underline{1.46:1}}$$

$$\text{The calculation, Year 0004: } \frac{\$859,300}{\$555,200} = \underline{\underline{1.55:1}}$$

This ratio tells us that in Year 0003 there is \$1.46 in assets for each \$1.00 of liabilities (debt). Creditors prefer to see this ratio as high as possible; that is, as high as 2:1 or more. The higher the ratio, the more security they have. They want to be assured that they will recover the full amount owed them in the event of bankruptcy or liquidation of the business. If the ratio sinks below 1:1, it could mean that if bankruptcy occurred, they might not recover the full amount owed them. In bankruptcy cases, the value of assets decreases rapidly. This is known as asset shrinkage; it occurs because the value of many of the productive assets declines when those assets are not employed in a going concern. In the situation illustrated, note that in Year 0004 the ratio improves (from the point of view of the creditors) to \$1.55 for each dollar of liabilities.

The total assets to total liabilities ratio is traditionally based on assets at their book value. If a hotel or food service operation includes land and buildings, which it owns, at book value in this calculation, the ratio could be misleading. Land and buildings frequently appreciate (increase in value) over time. Therefore, a total assets to total liabilities ratio based on the book value of assets showing a result as low as 1:1 may not be as bad as it seems from the creditors' point of view. If assets were used at fair market or replacement value, the ratio would probably improve and then show a comfortable margin of safety.

TOTAL LIABILITIES TO TOTAL ASSETS RATIO

The total liabilities to total assets ratio is the reverse of the total assets to total liabilities ratio. These figures are extracted from Exhibit 4.1.

Total liabilities / Total assets

$$\text{The calculation, Year 0003: } \frac{\$575,500}{\$839,400} = \underline{\underline{0.69:1}}$$

$$\text{The calculation, Year 0004: } \frac{\$555,200}{\$859,300} = \underline{\underline{0.65:1}}$$

This ratio tells us that in Year 0003 \$1.00 of assets was financed by debt of \$0.69 (the balance of \$0.31 was financed by equity). In Year 0004, each \$1.00 of assets was financed by \$0.65 of debt and \$0.35 of equity. Traditionally, the hospitality industry has been financed in a range between \$0.60 to \$0.90 of debt and \$0.10 to \$0.40 of equity. As debt financing reaches the higher number (\$0.90 out of each \$1.00), it becomes more and more difficult to raise money by debt. The risk is higher for the lender; therefore, potential lenders of money are more difficult to find. Again, this ratio is based on assets at book value. If fair market or replacement value of assets were used (assuming that this value is higher than book value), then the ratio would decline and would perhaps more realistically present the true situation.

TOTAL LIABILITIES TO TOTAL EQUITY RATIO

Sometimes known as the debt to equity ratio, the total liabilities to total equity ratio figures are extracted from Exhibit 4.1.

Total liabilities / Total equity

$$\text{The calculation, Year 0003: } \frac{\$575,500}{\$263,900} = \underline{\underline{2.18:1}}$$

$$\text{The calculation, Year 0004: } \frac{\$555,200}{\$304,100} = \underline{\underline{1.83:1}}$$

This ratio tells us that in Year 0003, for each \$1.00 the stockholders have invested, the creditors have invested \$2.18. In Year 0004 the comparable figures are stockholders \$1.00 and creditors \$1.83. The higher the creditors' investment for each \$1.00 of stockholders' investment, the higher is the risk for the creditor. In such circumstances, if a hotel or food service operation wished to expand, debt financing would be more difficult to obtain and interest rates would be higher.

The risk situation can perhaps be explained with some simple figures. Total assets equal total liabilities plus owners' equity. Assume total assets are \$100,000, total liabilities are \$50,000, and owners' equity \$50,000. The debt to equity ratio will be

$$\frac{\text{Total liabilities } \$50,000}{\text{Total equity } \$50,000} = \underline{\underline{1:1}} \text{ (or } \$1.00 \text{ of liabilities to } \$1.00 \text{ of equity)}$$

Under these circumstances total assets of \$100,000 could decline by 50 percent, to \$50,000, before the creditors would be running a serious risk. Assume, with

the same total assets of \$100,000, total liabilities are \$65,000 and owners' equity \$35,000. The debt to equity ratio will be

$$\frac{\text{Total liabilities } \$65,000}{\text{Total equity } \$35,000} = \underline{1.86:1} \text{ (or } \underline{\$1.86 \text{ of liabilities to } \$1.00 \text{ of equity)}}$$

With this higher debt to equity ratio, the assets could only decline 35 percent (as opposed to 50 percent) in value, from \$100,000 to \$65,000 before the creditors would be facing a difficult situation. This is much riskier from the creditors' point of view.

Therefore, although the creditors prefer not to have the debt to equity ratio too high, the hotel or food service owner often finds it more profitable to have it as high as possible. A high debt to equity ratio is known as having *high financial leverage* or *trading on the equity*. Financial leverage will be discussed in a later section of this chapter.

NUMBER OF TIMES INTEREST EARNED

Another way of looking at the margin of safety in meeting debt interest payments is to calculate the number of times per year interest is earned:

$$\text{Times interest earned} = \frac{\text{Income before interest and income tax}}{\text{Interest expense}}$$

$$\text{The calculation, Year 0004: } \$95,162 / \$26,044 = \underline{3.65 \text{ times}}$$

The times interest earned ratio is considered satisfactory if interest is earned two or more times a year. Creditors, owners, and management all like to see this ratio as high as possible. To creditors, a high number indicates a reduction of their risk and shows that the establishment will be able to meet its regular loan interest payments when due. To owners, a high number is also desirable, particularly if the establishment has a high debt to equity ratio. Therefore, management also prefers a high ratio because it pleases each of the other two groups. Note, however, that if this ratio is extremely high it might indicate that financial leverage is not being maximized.

PROFITABILITY RATIOS

The main objective of most hospitality operations is to generate a profit. In a partnership or proprietorship, the owner(s) can withdraw profit from the business entity to increase their personal net worth or can be left in the business to

expand it. In an incorporated company, the profit can be paid out in dividends or be retained in the business to expand it, increase the profits further, and improve the value of the owners' equity investment in the company. Creditors of a company also like to see increases in the business's profit, because the higher the profits, the less the risk is to them as lenders. Therefore, one of the main tasks of management is to ensure continued profitability of the enterprise. Profitability ratios are most often used to measure management's effectiveness in achieving profitability.

Caution needs to be exercised in the use of the word **profitability**. A company might have a net income on its income statement, and this net income, expressed as a percentage of revenue, might seem acceptable; however, the relationship between this net income and other items (for example, the amount of money invested by stockholders) may not be acceptable or sufficiently profitable.

The figures used in the discussion of the following profitability ratios are extracted from Exhibit 4.1 and Exhibit 4.2.

GROSS RETURN ON ASSETS

The gross return on assets ratio (also known as return on assets) measures the effectiveness of management's use of the organization's assets:

[Income before interest and income tax / Total average assets]

$$\begin{aligned}\text{Total average assets} &= (\$839,400 + \$859,300) / 2 \\ &= \$1,698,700 / 2 = \underline{\underline{\$849,350}}\end{aligned}$$

$$\text{The calculation: } \$95,162 / \$849,350 = \underline{\underline{11.2\%}}$$

If the figures fluctuated widely during the year because of such factors as the purchase and sale of long-term assets, and if monthly figures were available, the average should be calculated by adding each of the monthly figures and dividing by 12.

Interest and income tax is added back to net income in the equation to compare the resulting percentage (in our case, 11.2 percent) to the current market interest rate. For instance, if in our example, an expansion of the building were contemplated and the money could be borrowed at a 10 percent interest rate, one could assume that the new asset would earn a rate of return of 11.2 percent and it would be better than the 10 percent interest. Although small, this would leave 1.2 percent to increase the business's income before income tax.

NET RETURN ON ASSETS

The **gross return on assets** calculation measures management's effectiveness in its use of assets and is also useful in assessing the likelihood of obtaining

more debt financing for expansion. The **net return on assets**, on the other hand, evaluates the advisability of seeking equity, as opposed to debt financing:

Net income after income tax / Total average assets

The calculation: \$47,000 / \$849,350 = 5.5%

Since cash dividends or cash withdrawals are payable from earnings after tax, financing a building with stockholders' equity (or capital) would not lead to a very good dividend yield for stockholders. Based on current results, assets are only yielding a net return of 5.5 percent, and stockholders (or proprietary owners) would most likely assume that the new assets would earn the same net rate of return as the old assets. This might be a poor assumption, since the old assets are at book (depreciated) value. If the calculation were made on assets at their replacement or market value, the rate could well drop below 5.5 percent. Under these circumstances, management would have to improve its performance considerably to convince stockholders (or proprietary owners) to invest more money for an expansion.

NET INCOME TO SALES REVENUE RATIO

The **net income to revenue ratio** (also known as the **profit margin**) measures management's overall effectiveness in generating sales and controlling expenses:

Net Income after Income Tax / Sales Revenue

The calculation: \$47,000 / \$1,175,200 = 4.0%

This means that, out of each \$1.00 of sales revenue, we had 4 cents net income. In absolute terms, this might not be very meaningful, because it does not truly reflect the profitability of the firm. Consider the following two cases using assumed values:

	<i>Case A</i>	<i>Case B</i>
Sales revenue	\$100,000	\$100,000
Net income	5,000	10,000
Net income to revenue ratio	5.0%	10.0%

With the same revenue, it seems that Case B is better. In Case B, the organization is making twice as much net income, in absolute terms, as is organization A (\$10,000 to \$5,000). This doubling of net income is supported by the net income to revenue ratio (10.0% to 5.0%). If these were two similar firms, or two branches of the same firm, these figures would indicate the relative

effectiveness of the management of each in controlling costs and generating a satisfactory level of net income. However, to determine the profitability of A to B, we need to relate the net income to the investment to find the return on owners' equity (ROE):

	<i>Case A</i>	<i>Case B</i>
Sales revenue	\$100,000	\$100,000
Net income	5,000	10,000
Net income to revenue ratio	5%	10%
Owners' equity	\$40,000	\$80,000
Profitability (ROE)	$\frac{\$5,000}{\$40,000} = \underline{\underline{12.5\%}}$	$\frac{\$10,000}{\$80,000} = \underline{\underline{12.5\%}}$

As can now be seen, despite the wide difference in net income and net income to revenue ratio, there is no difference between the two organizations as far as profitability as measured by ROE is concerned: they are both equally good, returning 12.5 percent on owners' equity.

RETURN ON OWNERS' EQUITY

There are many equations and definitions for return on investment. Should we use (1) income before income tax, (2) income before interest and income tax, or (3) net income after tax? Is the investment (1) the book value of assets, (2) the replacement or market value of the assets, (3) the total investment of debt and equity, or (4) only the stockholders' equity? Perhaps the most useful definition of return on investment is to use net income after income tax (because dividends can only be paid out of after-tax profits) and relate that net income to the stockholders' investment. It is to this group of people, the stockholders or owners, that operating management is primarily responsible. The return on stockholder's equity equation is

Net income after income tax / Average stockholder's equity

$$\begin{aligned} \text{Average stockholder's equity: } & (\$263,900 + \$304,100) / 2 \\ & = \$568,000 / 2 = \underline{\underline{\$284,000}} \end{aligned}$$

$$\text{The calculation: } \$47,000 / \$284,000 = \underline{\underline{16.5\%}}$$

This percentage shows the effectiveness of management's use of equity funds and at 16.5 percent is highly satisfactory. How high should it be? This is a matter of personal opinion. If an investor could put money either into the bank at an 8 percent interest rate or into a hotel investment at 10 percent but with more risk involved, the current investment (16.5 percent return) might be the

best option with the bank being the next best choice. Even though the hotel investment has a higher return, it is riskier so likely the least attractive option.

Note that if the business has issued both preferred and common stock, the return on stockholders' equity equation can be modified, with the numerator becoming net income less preferred dividends and the denominator becoming average common stockholders' equity. To the common stockholders, preferred stock is a form of debt on which a fixed dividend rate must be paid. To the extent that borrowing from preferred stockholders enhances profits and the added profits exceed the fixed rate of dividends paid to preferred stockholders, the additional earnings accruing to the common stockholders will be improved.

OTHER PROFITABILITY RATIOS

Other measures of profitability include annual earnings per share (EPS), dividend rate per share, and book value per share. Such ratios are of most concern to those buying and selling publicly traded stock on the open market and are of less concern to the internal management of the firm. However, management is held accountable by stockholders for producing a net income satisfactory to them, and earnings per share are frequently used to measure net income. The earnings per share ratio is also important because it tends to dictate the value of the shares in the market and indicates the desirability of purchasing the stock of the company to a potential purchaser. Assume there are 40,000 shares outstanding at both the beginning and the end of the year. The EPS equation is

Net income after income tax / Average number of common shares outstanding

The average number of shares outstanding is

(Beginning common shares + Ending common shares) / 2 was 40,000

The earnings per share would be

$$\frac{\$47,000}{40,000} = \underline{\underline{\$1.18}}$$

If both common and preferred stock have been issued, this equation has to be modified. The numerator will be net income (after tax) less preferred dividends. The denominator will be average number of common shares outstanding.

Note that earnings per share can be increased over time by not paying out all earnings as dividends to shareholders. By retaining all net income and by not paying dividends, the increases to retained earnings can be reinvested to expand the business. Therefore, the number of shares outstanding will be held constant and future profits (earnings) will be increased.

CREDITORS, OWNERS, AND MANAGEMENT

In general, all three groups (creditors, owners, and management) interested in financial ratios prefer to see profitability ratios high and growing rather than low and stable. Creditors will be interested in a ratio such as return on assets, particularly if it is increasing, because this indicates management's effectiveness in its use of all assets and reduces the creditors' risk.

On the other hand, the ratio of most interest to owners is return on their equity investment because they can easily compare this ratio with the return they might receive from alternative investments. In public companies, if equity investors are not satisfied with their return they can remove their investment by selling their shares in the stock market and purchasing shares in more "profitable" companies. If many equity investors with large shareholdings do this, it will depress the market price of the shares. In turn, this will make it more difficult for the company to raise money when needed in the future because there will be a reluctance by potential investors to buy the new shares. Stock market investors often measure the value of a share by its **price/earnings ratio** calculated as follows:

$$\frac{\text{Market price per share}}{\text{Earnings per share}}$$

If the market price of the shares were \$10.00, our price/earnings ratio would be

$$\frac{\$10.00}{\$1.18} = \underline{\underline{8.47 \text{ times}}}$$

The price/earnings ratio for any specific hospitality company's shares is affected by how buyers and sellers of those shares perceive the stability and/or trend of earnings, the potential growth of earnings, and the risk of investing in those shares.

Management's task is to maintain all profitability ratios at as high a level as possible so that both creditors and owners (investors) are satisfied. The level of that satisfaction in this regard will measure management's effectiveness.

ACTIVITY RATIOS

Activity ratios (sometimes known as **turnover** or efficiency ratios) are calculated to determine the activity of certain classes of assets, such as inventories for resale, working capital, and long-term assets. The ratios express the number of

times that an activity (turnover) is occurring during a certain period and can help in measuring management's effectiveness in using and controlling these assets.

INVENTORY TURNOVER RATIO

Inventory turnover ratios are discussed in some detail in the section on cash conservation and working capital management in Chapter 11. For our purpose, only the basic turnover ratio and the subsequent ratio to determine the number of days inventory is held will be discussed at this point. The inventory turnover ratio equation is

$$\text{Cost of sales for the period} / \text{Average inventory during the period}$$

Inventory turnover can be determined on a monthly, quarterly, semiannual, or yearly basis. We will assume the following information regarding inventory for the Month of March is as follows:

Food inventory on March 1: \$ 8,434
Food inventory on March 31: \$ 6,870
Cost of sales for March: \$55,700

$$\text{Average inventory} = (\$8,434 + \$6,870) / 2 = \$15,304 / 2 = \underline{\underline{\$7,652}}$$

$$\text{The calculation: } \$55,700 / \$7,652 = \underline{\underline{7.3}} \text{ times during March}$$

Inventory Holding Period [Average Days for Inventory to Turnover]

The inventory turnover ratio expresses the number of times during a given period that inventory is theoretically brought to zero. A further analysis will establish the number of days it takes the inventory to turnover during a given period. Using the preceding inventory ratio for March 2004, the equation to convert inventory turnover to days is:

$$\frac{\text{Operating days for the period}}{\text{Inventory turnover ratio for the period}}$$

$$\text{The calculation: } 31 \text{ days} / 7.3 \text{ times} = \underline{\underline{4.25}} \text{ days}$$

Food and beverage inventories will vary based on the geographical area and the size of the city or towns within a given geographical area. Food turnover on the average will normally vary between two and four times a month. Beverage turnover varies from one to four times per month. Individual operations should determine in each case the turnover rate appropriate to the area in which the establishment operates (since there are major exceptions to these guidelines), and

then watch for deviations from those rates. The turnover rate of 4.2 days is quite fast compared to the standard stated above. However, if this is a fast-food operation in a chain, this turnover rate would be typical.

WORKING CAPITAL TURNOVER

The **working capital turnover** ratio is a measure of the effectiveness of the use of working capital. **Working capital** is current assets less current liabilities. Our balance sheet (Exhibit 4.1) gives us the following:

	<i>Year 0003</i>	<i>Year 0004</i>
Current assets	\$73,370	\$79,090
Current liabilities	(62,700)	(68,400)
Working capital	<u>\$10,670</u>	<u>\$10,690</u>

The equation for working capital turnover is

Total sales revenue / Average working capital

[Average working capital = (\$10,670 + \$10,690) / 2 = \$21,360 / 2 = \$10,680]

The calculation: \$1,175,200 / \$10,680 = 110.0 times

The ratio calculated based on data from Exhibit 4.1 is rather high. However, this ratio can vary widely based on geographical locations. In general, the rapidly increased use of credit cards relative to accounts receivable has had the effect of increasing working capital turnover ratios. Normally the ratio may be as low as 12 times per year (for a restaurant) or as high as 50 times or more a year (for a hotel).

A hospitality operation should probably try to find its most appropriate level of working capital and then compare future performance with this optimum level. Too much working capital (that is, too low a turnover ratio) means ineffective use of funds. Too little working capital (indicated by too high a turnover ratio) may lead to cash difficulties if revenue begins to decline.

Note also that, all other factors being equal, the higher the working capital turnover ratio, the lower will be the current ratio. This means that if an establishment has little or no credit sales and a very low level of inventory (e.g., a motel doing cash-only business), it will have both a low current ratio and a high working capital turnover. Thus, with reference to the earlier section on the current ratio, creditors prefer a low working capital turnover, owners prefer a high turnover, and management tries to maintain a reasonable balance between the two extremes to maximize profits by reducing the amount of money tied up in current assets, while maintaining sufficient liquidity to take care of unanticipated emergencies requiring cash.

FIXED ASSET TURNOVER

The **fixed asset turnover** ratio assesses the effectiveness of the use of fixed assets in generating revenue. Exhibit 4.1 provides the figures. The equation is

Total sales revenue / Total average fixed assets

$$\begin{aligned}\text{Total average fixed assets} &= (\$766,030 + \$780,210) / 2 \\ &= \$1,546,240 / 2 = \underline{\underline{\$773,120}}\end{aligned}$$

$$\text{The calculation: } \$1,175,200 / \$773,120 = \underline{\underline{1.52 \text{ times}}}$$

In the hotel industry, this turnover rate could vary from as low as one-half to as high as two or more times per year. In the food service industry, a restaurant could have a turnover of four or five times a year if assuming it is in rented premises. The reason the turnover rate is lower for a hotel is that it has, relatively speaking, a much higher investment in public space (lobbies, corridors) and in guest rooms (the capacity of which cannot be changed in the short run) than does a restaurant. A restaurant can increase its fixed asset turnover rate by increasing the number of seats or, if the demand is there, serving more customers during each meal period.

A high fixed asset turnover ratio indicates management's effectiveness in its use of fixed assets, whereas a low ratio either indicates that management is not effective or that some of those assets should be disposed of to increase the ratio. All groups (creditors, owners, and management) like to see the ratio as high as possible. One problem with this ratio, however, is that the older the assets are (and the more accumulated depreciation there is) the lower is their net book value. This automatically tends to increase the fixed asset turnover ratio. In addition, the use of an accelerated depreciation method hastens this process. Thus, management should resist the temptation to continue to use old and inefficient fixed assets and/or to use an accelerated depreciation method to create a high fixed asset turnover.

One of the uses of this ratio is in evaluating new projects. If the current turnover for a restaurant is four, and a new project costing \$250,000 is going to generate \$750,000 in revenue, giving a turnover of only three (\$750,000 divided by \$250,000), the new project may not be acceptable or sufficiently profitable.

OPERATING RATIOS

There are a number of other revenue and cost analysis techniques and tools available apart from those already mentioned. Some of the more common ones are discussed briefly in the next section. Caution must be exercised in their use.

It is not only important to select the appropriate analysis tool, it is also important to remember that the information provided from the use of these techniques may only indicate that a problem exists. The solution to the problem is entirely in the hands of management.

FOOD AND BEVERAGE OPERATIONS

Food and/or Beverage Cost Percentage

This is expressed as a percentage of the related revenue as illustrated and discussed in the previous chapter using Exhibit 3.4. The cost percentages can be compared with a standard or predetermined cost percentage established as a goal in the forecasted operating budget. Any major deviations from standard to actual cost percentages should be investigated.

Labor Cost Percentage

Labor cost includes employee benefits and is expressed as a percentage of related revenue. With reference to Exhibit 3.4, in Year 0003 and Year 0004 the labor cost percentage is

(Salaries and wages + Employee benefits) / Total sales revenue

Year 0003: $(\$277,400 + \$34,500) / \$851,600 = \$311,900 / \$851,600 = \underline{\underline{36.6\%}}$

Year 0004: $(\$304,500 + \$37,800) / \$869,100 = \$342,300 / \$869,100 = \underline{\underline{39.4\%}}$

As with food and beverage cost percentages, labor cost percentages can be compared with established standard cost percentages. Again, large differences between standard and actual cost percentages should be investigated.

Dollars of Revenue

This ratio may be expressed in per-employee terms on a per-meal period, per-day period, per-week period or per-month period. For example, if a restaurant had revenue for a meal period of \$1,200, and 100 guests were served by eight employees, the average dollars of sales revenue per server for a given meal period would be

**Meal period sales revenue / Meal period servers = $\$1,200 / 8$
= \$150 sales revenue per server**

The average number of guests served per server:

(Guests served / Number of servers) = $100 / 8 = \underline{\underline{12.5}}$ guests per server

These ratios are used primarily to assess employee productivity against a standard or to determine any upward or downward trend in productivity.

Average Food and/or Beverage Check by Meal Period and by Revenue Area

The method of calculating the average check was explained in Chapter 3. The trend of this figure is important, but it can also be used to determine, for example, the effect that a change in menu item(s) may have on an average customer's spending.

Seat Turnover by Meal Period or by Day

Seat turnover is calculated by dividing total guests served during a meal period or a day by the number of seats the restaurant has. For example, if a restaurant had 40 seats and 100 guests were served during a given meal period, the seat turnover for that meal period would be: $100 \text{ guests} / 40 \text{ seats} = \underline{2.5}$.

A high turnover is generally preferable to a low one, as long as the customers are receiving good service and not being rushed. The trend of turnovers should be analyzed. A declining trend may indicate a lowering of service or may indicate that high prices or low-quality food are keeping customers away.

Daily, Weekly, Monthly, or Annual Revenue Dollars per Available Seat

Revenue per seat is calculated by dividing revenue for the period by the number of seats the restaurant has. For example, if a 125-seat restaurant had monthly sales of \$250,000, monthly revenue per seat is

$$\begin{aligned} \text{(Monthly sales revenue / Total seats)} &= \$250,000 / 125 \\ &= \underline{\underline{\$2,000}} \text{ revenue per seat} \end{aligned}$$

The trend of this figure can be revealing. It might also be useful to compare it with the results for similar types of establishments. However, if the guest buys a drink for \$4.00 instead of a food item for \$8.00, you are likely better to sell the food item because the dollar contribution margin is higher although the percent contribution margin is lower.

Percentage of Beverage Revenue to Food Revenue

For example, a restaurant had total monthly revenue of \$85,160, of which food was \$68,950 and beverages were \$16,210. Beverages are 23.5% of food revenue, calculated as follows:

$$\text{(Beverage sales revenue / Food sales revenue)} = \$16,210 / \$68,950 = \underline{\underline{23.5\%}}$$

Since beverage revenue is generally more profitable than food revenue, sales efforts should be directed toward promoting beverage revenue (wine with meals, for example) to increase the ratio.

Percentage of Beverage Revenue and/or Food Revenue to Rooms Revenue

This would apply to a hotel. The calculation is similar to the percentage to revenue example shown for the previous ratio. In this case, the room revenue becomes the denominator, and the numerator is either food or beverage sales revenue. A change in the revenue mix among departments (as indicated by a change in the percentages) can be important because some departments are more profitable than others. Advertising dollars are often more beneficially spent, from a cost/benefit point of view, on departments or areas with the highest gross margin or profitability before operating expenses.

ROOMS DEPARTMENT IN A HOTEL OR MOTEL

Average Rate per Occupied Room

This ratio may be calculated on a daily, monthly, or an annual basis by dividing sales revenue by rooms occupied for the specific period. For example, if a hotel had total revenue for a given night of \$7,200 from 80 rooms occupied, the average daily rate per occupied room is

$$\text{(Daily rooms sales revenue / Daily rooms occupied)} = \$7,200 / 80 = \underline{\underline{\$90}}$$

If this ratio is to be calculated on a monthly or annual basis, we use the same equation as shown above for a daily room rate, substituting monthly or annual figures for the daily numbers. The trend of this figure is important. It can be influenced upward by directing sales efforts into selling higher-priced rooms rather than lower-priced ones, by increasing the rate of double occupancy, or by altering other factors.

Revenue per Available Room (REVPAR)

A hotel's occupancy percentage and average room rate have traditionally been the tools used to measure the rooms department's performance. By themselves, each of these tools has limited value. For example, Hotel A with 200 rooms might have an average occupancy rate of 80 percent and an average daily room rate of \$70, while Hotel B, also with 200 rooms has an average occupancy rate of 70 percent and an average daily room rate of \$85. All other things being equal, which is the better performing hotel? The answer to this question is

difficult to determine without knowing the room revenue per available room (usually abbreviated to REVPAR), calculated for Hotel A as follows:

$$\text{REVPAR} = (\text{Total rooms revenue} / \text{Total rooms available})$$

$$\begin{aligned} \text{Hotel A: } & (200 \times 80\% \times \$70 \times 365) / (200 \times 365) \\ & = \$4,088,000 / 73,000 = \underline{\underline{\$56.00}} \end{aligned}$$

$$\begin{aligned} \text{Hotel B: } & (200 \times 70\% \times \$85 \times 365) / (200 \times 365) \\ & = \$4,343,500 / 73,000 = \underline{\underline{\$59.50}} \end{aligned}$$

Or an alternative calculation may be used, following a simplified equation:

$$\text{REVPAR} = (\text{Occupancy percentage} \times \text{Average room rate})$$

Using these figures, the relative performance of the two hotels measured in terms of REVPAR is as follows:

$$\text{Hotel A: } 80\% \times \$70 = \underline{\underline{\$56.00}}$$

$$\text{Hotel B: } 70\% \times \$85 = \underline{\underline{\$59.50}}$$

For measuring performance, REVPAR is thus an improvement over either occupancy percentage or average room rate.

Occupancy Percentage and/or Double Occupancy

This ratio may be calculated on a daily, weekly, monthly, or annual basis. The occupancy percentage is calculated by dividing the rooms occupied during a stated period by the total rooms available during the stated period (rooms available times days in the stated period). For example, with reference to the previous discussion, if this hotel had 110 rooms, occupancy for given night is

$$(\text{Rooms occupied daily} / \text{Rooms available daily}) = 80 / 110 = \underline{\underline{72.7\%}}$$

Double occupancy is based on the rooms sold, not the rooms available. The double occupancy percentage is the percentage of rooms occupied by more than one person. For example, if 80 rooms were occupied on a given night and 20 rooms were occupied by more than one person, the double occupancy rate is

$$(\text{Rooms double occupied daily} / \text{Rooms occupied daily}) = 20 / 80 = \underline{\underline{25\%}}$$

Double occupancy is sometimes expressed by calculating the average number of people per room occupied (total number of guests for a period divided by total rooms occupied during that period). For example, if 100 guests occupied 80 of the rooms available, the double occupancy rate would be

$$\begin{aligned} (\text{Room guests daily} / \text{Rooms occupied daily}) &= 100 / 80 \\ &= \underline{\underline{1.25}} \text{ average guests per room} \end{aligned}$$

Double occupancy is usually higher for resort hotels (catering to families) than for transient hotels (catering primarily to the business person traveling alone).

Obviously, a high occupancy and a high double occupancy are both desirable because this indicates greater use of the rooms facilities and also potentially greater use of food and beverage facilities by guest room occupants. Therefore, the trend of this information is important.

Note that, when an occupancy percentage is calculated for a period such as a week, it does not mean that the occupancy was the same every night of the week. For example, a hotel could have an average occupancy of 70 percent for a week and an occupancy rate of over 90 percent per night from Monday to Friday but a very low occupancy percentage at the weekend.

Labor Cost Percentage

This is expressed as a percentage of room revenue in the same way as was illustrated in the preceding discussion of labor cost percentage for food and beverage operations. It is compared with an established standard.

Number of Rooms Cleaned

This may be calculated as rooms per housekeeper per day and/or dollars of room revenue per front desk clerk per day, week, or month. These are both productivity measures calculated in a similar way to the productivity measures illustrated in labor cost percentage for food and beverage operations. These productivity measures can be compared against a standard or used to detect undesirable trends.

Annual Revenue per Available Room

This figure is obtained by dividing annual revenue by the rooms in the establishment. The trend of this figure is important, but it is also useful to compare it with results from similar types of hotels or motels.

Undistributed Cost Dollars per Available Room per Year

Undistributed costs include such expenses as administrative and general, marketing, property operation and maintenance, and energy costs. To determine the ratio, the total annual cost of each undistributed item is divided by the rooms in the establishment. Trends are again important, and comparison with similar establishments results can be revealing.

MANAGER'S DAILY REPORT

Many of the operating statistics that are useful for analyzing the ongoing progress of an establishment can be calculated on a day-to-day basis. In this way, the success level of the establishment can be monitored daily. Trends, favorable or unfavorable, can be detected while they are occurring, rather than too late for effective action to be taken. A sample of a **manager's daily report** that would

Day _____		Date _____		Weather _____						
	<i>Today</i>	<i>Month to Date</i>	<i>Forecast Month to Date</i>	<i>Last Month to Date</i>	<i>Last Year Month to Date</i>					
Rooms										
Food										
Beverage										
Telephone/Telegram										
Valet										
Laundry										
Other										
Total Revenue										
Statistics										
	<i>Today</i>	<i>Month to Date</i>	<i>Forecast Month to Date</i>	<i>Last Month to Date</i>	<i>Last Year Month to Date</i>	<i>Bank Report</i>				
Total Rooms Occup.						Balance Yesterday				
Comps. & House Use						Receipts				
Vacant Rooms						Disbursements				
Total Rooms Avail.						Balance Today				
Average Room Rate						<i>Accounts Receivable</i>				
% of Occupancy										
No. of Doubles						Balance Yesterday				
% of Double Occup.						Charges				
% of Food Cost						Credits				
% of Beverage Cost						Balance Today				
Payroll and Related Expenses										
	<i>Today</i>		<i>Forecast Month to Date</i>		<i>Last Month to Date</i>		<i>Last Year to Date</i>		<i>Month to Date</i>	
	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>
Room										
Food & Beverage										
Overhead Depts.										

EXHIBIT 4.6

Hotel Manager's Daily Report

Day _____	Date _____					Weather _____					
	Number of Covers					Average Check					
				<i>Totals</i>		<i>Average Today</i>			<i>Check to Date</i>		
Meals Served:	<i>Breakfast</i>	<i>Lunch</i>	<i>Dinner</i>	<i>Today</i>	<i>to Date</i>	<i>Breakfast</i>	<i>Lunch</i>	<i>Dinner</i>	<i>Breakfast</i>	<i>Lunch</i>	<i>Dinner</i>
Dining Room											
Coffee Shop											
Room Service											
Banquet											
TOTAL											

EXHIBIT 4.7

Food Service Daily Report

be useful in a small hotel operation is illustrated in Exhibit 4.6. A food operation's operating statistics might be summarized as shown in Exhibit 4.7. Each establishment's management should decide which operating statistics are most useful for getting a daily overview and, subsequently, should prepare a form that will allow these statistics to be summarized quickly each day.

INTERNAL AND EXTERNAL COMPARISONS

Up to this point, only internal comparisons and trends of selected information have been emphasized. A change in selected internal information over time is probably the most meaningful method of seeking out problem areas so that any necessary corrective action can be taken. Nevertheless, external comparisons and trends should not be ignored. Many industrywide external trends are available that can be useful for comparison with internal results. However, trying to change internal results so they match external industry averages should be done with caution. Industry averages are only that—averages. An average industry figure might not be typical of any specific hotel or food service operation. The management needs to understand why their operation is different from the average operation and what effect that should have on the operation's ratios.

CONCLUDING COMMENTS ON RATIO ANALYSIS

To summarize this discussion of ratios, note these points:

- Financial ratios are generally produced from historical accounting information. As a result, some accounting numbers reflect historic costs rather than present values. An example is a building's cost recorded on the balance sheet at its original purchase price and offset by accumulated depreciation to produce net book value. A ratio based on total assets (such as return on assets) may show a result that is more than acceptable. If it were based on the current replacement cost of those assets, however, it would produce a much more realistic ratio that can then be compared with alternative investments. For this same reason, this type of ratio cannot be readily compared with the ratio for other hospitality companies because they may have purchased their assets at different times or at different costs, and may have used different depreciation methods.
- Many of the guidelines or rules of thumb given in this chapter on ratio analysis have assumed ownership of all assets. If assets, particularly land, building, furniture, and equipment are leased rather than owned, then these industry-quoted guidelines must be used with caution. Indeed, rules of thumb should always be used with great care, because every organization that is part of the hospitality industry has its own unique features. This leads to the next comment.
- Ratios are only of value when two related numbers are compared. For example, the current ratio compares current assets with current liabilities. This is a meaningful comparison. On the other hand, if current assets are compared to owners' equity, this ratio has little value because there is no direct relationship between the two numbers.
- Although external comparisons of an operation's ratios with industry averages or other similar hotels or food operations are interesting, what is probably of more value is comparing the trend of the operation's ratios over time. For example, if the working capital turnover ratio is constantly increasing over the years, with little change in sales revenue, this might be more indicative of a problem than the fact that the ratio is different from the industry average.
- This chapter has tried to include all the ratios that could be useful to a hospitality enterprise. There is no suggestion that a particular operator should use all of them. Selectivity is important. One should use those that are of benefit in evaluating the results of a business in relation to its objectives.

- Ratios should not be an end in themselves. An objective of a company might be to have the happiest stockholders in the world. Emphasis might then be placed solely on increasing net income to the point where the stockholders will see an incredibly large return on their investment. The end result might be that, to achieve this, selling prices have been set so high, and expenses cut so low, that the business collapses.
- Finally, ratios by themselves cure no problems but only indicate possible problems. For example, the trend of the accounts receivable ratio might show that the time that it is taking to collect the average accounts receivable is becoming longer. That is all the ratio shows. It is only management's analysis of this problem to discover the causes that can correct this deteriorating situation.

FINANCIAL LEVERAGE

Earlier in this chapter, the concept of financial leverage, or trading on the equity, was introduced. To illustrate this, consider the case of a new restaurant that is to be opened at a cost of \$250,000 (for furnishings, equipment, and working capital). The owners have the cash available, but they are considering not using all their own money. Instead, they wish to compare their relative return on equity if they use either all their own money (100% equity financing) or if they use 50 percent equity and borrowing the other 50 percent (debt financing) at a 10 percent interest rate. Regardless of which method they use, revenue will be the same, as will all operating costs. With either choice, they will have \$50,000 income before interest and taxes. There is no interest expense with the 100 percent equity financing option. With some debt financing interest will have to be paid. However, interest expense is tax deductible. Assuming a tax rate of 42 percent on taxable income, Exhibit 4.8 shows the comparative operating results and the return on equity (ROE) based on the initial equity investment.

In Exhibit 4.8, not only do the owners make a better return on their initial investment under Option B (17.4 percent versus 11.6 percent), but they also still have \$125,000 in cash they can invest in a second venture. In this case, if a 50/50 debt to equity ratio is more profitable than 100 percent equity financing, would not an 80/20 debt to equity ratio be even more profitable? In other words, what would be the return on initial investment if the owners used only \$50,000 of their own money and borrowed the remaining \$200,000 required at 10 percent? Exhibit 4.9 shows the result of this more highly leveraged situation.

Under Option C, Exhibit 4.9, our return on initial investment has now increased to 34.8 percent, and we have \$200,000 cash still on hand—enough for four more similar restaurant ventures. The advantages of financial leverage are

	<i>Option A</i>	<i>Option B</i>
Investment required	<u>\$250,000</u>	<u>\$250,000</u>
Equity financing	\$250,000	\$125,000
Debt financing	<u>0</u>	@ 10% <u>\$125,000</u>
Income before interest and income tax	\$ 50,000	\$ 50,000
Interest expense	<u>0</u>	(12,500)
Income before income tax	\$ 50,000	\$ 37,500
Income tax (@ 42%)	(21,000)	(15,750)
Net income	<u>\$ 29,000</u>	<u>\$ 21,750</u>
Return on equity	$\frac{\$29,000}{\$250,000} = \underline{\underline{11.6\%}}$	$\frac{\$21,750}{\$125,000} = \underline{\underline{17.4\%}}$

EXHIBIT 4.8

Effect of Financial Leverage on ROE

obvious: The higher the debt to equity ratio, the higher will be the owners' return on equity. However, this only holds true if income before interest and income tax is greater than the interest to be paid on the debt. The higher the debt, the greater the risk.

If income declines, the more highly leveraged a company is, the sooner it will be in financial difficulty. In Option B (relatively low leverage), income before interest and income tax could decline from \$50,000 to \$12,500 before net income would be zero. In Option C (relatively high leverage), income before

	<i>Option C</i>
Investment required	<u>\$250,000</u>
Equity financing	\$ 50,000
Debt financing	@ 10% <u>\$200,000</u>
Income before interest and income tax	\$ 50,000
Interest expense	(20,000)
Income before income tax	\$ 30,000
Income tax (@ 42%)	(12,600)
Net income	<u>\$ 17,400</u>
Return on equity	$\frac{\$17,400}{\$50,000} = \underline{\underline{34.8\%}}$

EXHIBIT 4.9

Effect of High Financial Leverage on ROE

interest and income tax could only decline from \$50,000 to \$20,000 before net income would be zero.

COMPUTER APPLICATIONS

Because most of the ratios discussed in this chapter result from an operation's income statement and balance sheet, if a computer is used to produce those statements, then the ratios can also be automatically produced.

In addition to the period-end ratios, if information about the operation's daily operations is stored in the computer, then the desired daily operating ratios can be calculated and printed out on the daily report. For example, if a hotel's night audit is computerized, ratios such as occupancy, double occupancy, average room rate, and revenue per available room can also be automatically calculated.

Restaurants can also keep track of sales, daily purchases, usage, and sales of food—daily and period-to-date food cost is automatically calculated.

Further, if an operation's payroll is computerized and linked to a computerized time clock, each employee's pay rate can be applied to daily hours worked, and total daily labor cost can be calculated by the system for the department. If each day's sales are entered for a department, a daily labor cost percentage can be calculated for cost control purposes.

S U M M A R Y

A number of different ways of expressing ratios were discussed in this chapter, as were four methods of evaluating a ratio: industry averages, competitors' figures, the operation's results from a previous period, and a predetermined standard for the operation. Current liquidity ratios measure a company's ability to meet its short-term obligations. Some of the more common *liquidity* ratios are:

1. Current ratio:
$$\frac{\text{Current assets}}{\text{Current liabilities}}$$
2. Quick (acid test) ratio:

$$\frac{\text{Cash} + \text{Credit card receivables} + \text{Accounts receivable} + \text{Marketable securities}}{\text{Total current liabilities}}$$

or
$$\frac{\text{Total current assets} - \text{Inventories for resale} - \text{Prepaid expenses}}{\text{Current liabilities}}$$

3. Credit card receivables as a percentage of credit card revenue:

$$\frac{\text{Average credit card receivables}}{\text{Credit card revenue}}$$

4. Credit card receivables turnover:

$$\frac{\text{Credit card revenue}}{\text{Average credit card receivables}}$$

5. Average credit cards collection period:

$$\frac{\text{Days in the period}}{\text{Credit card turnover ratio for the period}}$$

6. Accounts receivable as a percentage of accounts receivable credit revenue:

$$\frac{\text{Average accounts receivable}}{\text{Accounts receivable credit revenue}}$$

7. Accounts receivable turnover:

$$\frac{\text{Accounts receivable credit revenue}}{\text{Average accounts receivable}}$$

8. Accounts receivable average collection period:

$$\frac{\text{Days in the period}}{\text{Accounts receivable turnover ratio for the period}}$$

Another useful technique is to make a common-size analysis of current assets. Total current assets are 100 percent, and each item of current assets is expressed as a proportion of 100 percent. By comparing two or more consecutive periods, such an analysis can indicate a change in liquidity due to a change in the proportions of each current asset relative to total current assets.

Long-term solvency ratios, sometimes called net worth ratios, measure a company's ability to meet its long-term credit obligations:

1. Total assets to total liabilities ratio = $\frac{\text{Total assets}}{\text{Total liabilities}}$

2. Total liabilities to total assets ratio = $\frac{\text{Total liabilities}}{\text{Total assets}}$

$$3. \text{ Total liabilities to total equity ratio} = \frac{\text{Total liabilities}}{\text{Total stockholders' equity}}$$

$$4. \text{ Times interest earned ratio} = \frac{\text{Income before interest and income tax}}{\text{Interest expense}}$$

Profitability ratios provide information that can be used to measure the effectiveness of management's use of the assets (resources) available to conduct operations:

$$1. \text{ Gross return on assets} = \frac{\text{Income before interest and income tax}}{\text{Total average assets}}$$

$$2. \text{ Net return on assets} = \frac{\text{Net income after tax}}{\text{Total average assets}}$$

$$3. \text{ Net income to sales revenue ratio} = \frac{\text{Net income after income tax}}{\text{Sales revenue}}$$

$$4. \text{ Return on stockholders' equity} = \frac{\text{Net income after income tax}}{\text{Average stockholders' equity}}$$

$$5. \text{ Earnings per share} = \frac{\text{Net income after income tax}}{\text{Average number of shares outstanding}}$$

$$6. \text{ Price/earnings ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

Turnover ratios include the following:

$$1. \text{ Inventory turnover ratio} = \frac{\text{Cost of sales for the period}}{\text{Average inventory for the period}}$$

$$2. \text{ Inventory holding period:} \frac{\text{Operating days in the period}}{\text{Inventory turnover ratio for the period}}$$

$$3. \text{ Working capital turnover ratio} = \frac{\text{Sales revenue}}{\text{Average working capital}}$$

$$4. \text{ Fixed asset turnover ratio} = \frac{\text{Sales revenue}}{\text{Total average fixed assets}}$$

Many individual operating ratios are available for food and beverage operations, as well as for the rooms operations in a motel or hotel. Ratios should be selected for use, which are most appropriate for the operation being analyzed

and evaluated. A daily manager's report is normally prepared to record information and statistics that management requires.

Although internal comparisons and analysis are most useful, there are a great many industrywide statistics published for different hospitality organizations. External data and information should not be overlooked to assist in comparing of internal results. Comparison of appropriate external statistics to a complete internal analysis can provide greater insight into the effectiveness of the internal management.

The reader is cautioned to use ratio analysis with care and not to use general rules of thumb as necessarily being the norm for all businesses. What is most valuable is not how an individual operation's ratios differ from similar external operations, but how the internal results are changing over time. Selection of and discretion in using the right ratio for the right occasion should be exercised. Ratios should not become an end in themselves.

Finally, ratios cannot solve problems, they only identify possible problems that only management's evaluation and corrective action can resolve.

This chapter concluded with some comments on the concept of financial leverage, or trading on the equity to increase capital. Financial leverage is obtained by using debt rather than equity investment to finance an enterprise. As long as operating income before interest is greater than the interest expense, the owners' return on equity will be higher. However, a too highly leveraged company may quickly be in financial trouble if operating income before interest begins to decline.

DISCUSSION QUESTIONS

1. Describe the three ways in which a ratio can be expressed.
2. List and briefly discuss the four bases on which a ratio can be compared.
3. Which three groups are the main users of financial ratios?
4. What is the value in calculating a current ratio? Contrast how creditors and owners view this ratio.
5. Why can a hotel, motel, or restaurant usually operate with a current ratio considerably lower than other types of businesses, such as manufacturing companies?
6. Why is maintaining a current ratio that is too high not a good business practice?
7. Explain why the calculation of a credit card receivables average collection period is a meaningful statistic.
8. Define the term profitability.
9. Why is a high total asset to total liabilities ratio desired by creditors?

10. Why can the book values of assets be misleading when used in the total assets to total liabilities ratio, or the total liabilities to total assets ratio?
11. State the equation for the credit card turnover ratio.
12. Explain the gross return on assets ratio measure; what value is it to a potential creditor?
13. How does the net return on assets ratio differ from the gross return on assets ratio, and why is its calculation valuable?
14. Discuss the purpose of a quick ratio.
15. What does the return on stockholders' equity measure?
16. State how revenue per available room is calculated.
17. Discuss the term financial leverage, or trading on the equity.
18. List four possible operating ratios that could be used in a food operation.
19. List and discuss three operating ratios that could be used in a rooms operation.
20. What is the advantage of calculating the inventory holding period in days?

E T H I C S S I T U A T I O N

A hotel manager wishes to borrow additional funds from his bank early in the next year. He knows the bank manager uses the hotel's current ratio as a major factor in his decision process in making a loan. He also knows that the bank manager likes to see a current ratio that is considerably higher than that for a typical hotel. On December 31, he instructs his accountant to make up journal entries on that date to record the sale of all of the hotel's marketable securities and the use of the cash proceeds to reduce accounts payable (even though none were actually sold). In this way, the December 31 balance sheet will show a current ratio much higher than it actually is. The accountant was also instructed to reverse the journal entries on January 1. Discuss the ethics of this situation.

E X E R C I S E S

- E4.1** A restaurant reported the following current assets: cash \$12,000, credit card receivables \$1,800, accounts receivable \$180, food inventory \$4,400, and prepaid expenses, \$1,120. Current liabilities total \$7,800. Answer the following:
- a. Calculate the current ratio.
 - b. Calculate the quick ratio (acid test ratio).
- E4.2** Referring to information in Exercise 4.1, calculate working capital and describe what it means.

- E4.3** On March 31, a restaurant reported credit card revenues of \$56,280. Credit card receivables began with a balance of \$2,884 and ended the month with a balance of \$3,120. Answer the following:
- What is the average of credit card receivables?
 - What does credit card receivables represent as a percentage of total credit card revenue?
- E4.4** The following is an extract of restaurant and beverage operation for two months of operations:

	<i>Month 1</i>	<i>Month 2</i>
Cash	\$11,270	\$13,524
Credit card receivables	2,890	2,933
Accounts receivable	<u>289</u>	<u>301</u>
Total Quick Assets	<u>\$14,449</u>	<u>\$16,758</u>

Complete a common-size vertical analysis of quick assets for both months and comment on the changes to quick assets. Round final answers to the nearest tenth of a percentile.

- E4.5** Total current assets reported for an operation were \$86,100 and total current liabilities were \$62,400. Determine working capital for the period and define its structure and purpose.
- E4.6** You are given the ending working capital for two consecutive years: Year 1 was \$10,500, and Year 2 is \$11,550. Sales revenue for Year 2 is \$878,444. Calculate the working capital turnover ratio.
- E4.7** A restaurant and beverage operation reported the following for the operating month of March, which had 23 operating days.

Food service inventory:	<u>March 1</u>	<u>March 31</u>	<u>Cost of Sales</u>
	\$8,868	\$5,740	\$36,520

For the month of March, calculate the food inventory turnover ratio and inventory holding period in days that it takes for food inventory to turn over.

- E4.8** Information showing total assets and total liabilities for two consecutive operating years is given below:

	<i>Year 0003</i>	<i>Year 0004</i>
Total assets	\$486,400	\$512,240
Total liabilities	\$330,752	\$347,290

Calculate the total assets to total liabilities ratio for both years and comment on the change. Do any additional analysis you need so you can comment on these figures.

- E4.9** Assume you were given information regarding current ratios for three consecutive years. Can you determine the general condition of liquidity without calculating working capital? If the following ratios apply to a restaurant, would the ratio for Year 3 be considered adequate? Explain your answers to the questions.

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>
Current ratio	1.44:1	1.35:1	1.20:1

- E4.10** Prepare a comparative horizontal analysis of the change in each current asset account from Year 1 to Year 2. Express each change in dollars and the percentage each change represents. Comment on each change that exceeds 10 percent. What, if anything, would you do as a manager?

<i>Current Assets</i>	<i>Year 1</i>	<i>Year 2</i>
Cash	\$12,800	\$14,720
Credit card receivables	2,800	3,360
Accounts receivable	420	100
Food inventories	4,280	4,366
Beverage inventories	1,850	1,702
Prepaid expenses	1,400	1,610
Total Current Assets	<u>\$23,550</u>	<u>\$25,858</u>

PROBLEMS

- P4.1** A small restaurant reported the following current assets at year's end: Cash \$1,840, accounts receivable \$220, credit card receivables \$480, food inventories \$1,340, prepaid insurance \$400, and prepaid rent \$1,000. Current liabilities were \$2,112. Complete a common-size vertical analysis of current assets and calculate the current and quick ratios.

- P4.2** You have information (on the next page) regarding current assets and current liabilities of a restaurant operation for two successive years:

Calculate the following for Years 0003 and 0004:

- Working capital
- Current ratio

- c. Quick ratio
Sales revenue for Year 0004 is \$544,800. The composition of revenue is cash 34 percent, credit card revenue 63.5 percent, and accounts receivable credit revenue 2.5 percent. For Year 0004, calculate the following:
- d. Credit card receivables as a percentage of credit card revenue
- e. Credit card receivables turnover ratio
- f. Credit card average collection period
- g. Accounts receivable as a percentage of accounts receivable credit revenue
- h. Accounts receivable turnover ratio
- i. Accounts receivable average collection period
- j. Cost of sales was \$212,472; calculate cost of sales as a percentage of sales revenue
- k. Comment on what these ratios tell you about the restaurant?

<i>Current Assets</i>	<i>Year 0003</i>	<i>Year 0004</i>
Cash	\$11,500	\$15,700
Credit card receivables	3,720	4,880
Accounts receivable	480	220
Marketable securities	12,500	15,500
Inventories	5,600	8,100
Prepaid expenses	2,100	2,800
Total Current Assets	<u>\$35,900</u>	<u>\$47,200</u>

<i>Current Liabilities</i>	<i>Year 0003</i>	<i>Year 0004</i>
Accounts payable	\$ 9,600	\$13,100
Accrued expenses payable	4,700	6,200
Taxes payable	6,800	7,400
Interest payable	500	600
Current mortgage payable	11,200	9,900
Total Current Liabilities	<u>\$32,800</u>	<u>\$37,200</u>

- P4.3** With reference to the information in P4.2, use a common-size vertical analysis to determine the composition of current assets and current liabilities for Years 0003 and 0004. Discuss the results.
- P4.4** A fire occurred in a friend's restaurant overnight on December 31, 0005, and the friend has asked for your help. Although many accounting records

were lost, some were recovered. With the recovered records and information obtained from outside sources, you believe a balance sheet can be reconstructed for the period ending on the date of the fire. Your friend provided the following information:

- The forecasted current ratio as of December 31, 0005, was 1.25 to 1.
- Balance sheets for the previous three years indicated that current assets on average represented 25 percent of total assets.
- The bank reported the year-end bank balance was \$763. It was estimated that \$1,000 in the restaurant's safe was destroyed during the fire.
- The bank also indicated that it is owed \$23,000 on a long-term note, and the current amount due in Year 0006 is \$3,414.
- The value of ending inventories was \$4,915.
- Restaurant suppliers indicated that in total they were owed \$3,210 at the close of business on December 31, 0005.
- All employees were paid up to and including the night of the fire.

Calculate the following:

- a. Total current assets
- b. Credit card receivables, assuming current assets consisted only of cash, credit card receivables, and inventories
- c. Total assets
- d. Prepare a balance sheet as of December 31, Year 0005, to give to your friend.

P4.5 You have the following information taken from the balance sheets for two successive years for a hotel operation.

	<i>Year 0004</i>	<i>Year 0005</i>
Total assets	\$411,200	\$395,700
Total liabilities	302,400	315,500
Total stockholders' equity	108,800	80,200

For each year calculate:

- a. Total assets to total liabilities ratio
- b. Total liabilities to total assets ratio
- c. Total liabilities to total ownership equity

Discuss the changes that have taken place over the two-year period from the viewpoint of an investor who has been asked to loan the hotel money for expansion.

P4.6 In addition to the information given in Problem 4.5, an income statement for the hotel for Year 0005 is available:

Sales revenue	\$851,800
Operating costs	(798,900)
Operating income, before interest and tax	\$ 52,900
Less: Interest	(26,100)
Income before tax	\$ 26,800
Less: Income tax	(6,700)
Net Income	<u>\$ 20,100</u>

For Year 0005, calculate the following:

- a. Gross return on assets
- b. Net return on assets
- c. Number of times interest is earned
- d. Net income to revenue ratio; discuss hotel profitability
- e. Return on stockholders' equity; discuss hotel profitability

P4.7 You have the following information from a restaurant operation:

Balance Sheets, December 31

Assets	Year 0007	Year 0008
Cash	\$ 6,100	\$ 11,200
Credit card receivables	7,920	9,240
Accounts receivable	5,280	6,160
Food inventory	14,600	13,900
Prepaid expenses	3,800	4,500
Land	32,000	32,000
Building	315,800	323,200
Equipment	66,640	73,200
Furnishings	16,660	18,300
Accumulated depreciation	(113,700)	(124,500)
Total Assets	<u>\$355,100</u>	<u>\$367,200</u>
Liabilities & Stockholders' Equity	Year 0007	Year 0008
Accounts payable	\$ 16,700	\$ 12,500
Bank note payable	4,900	3,600
Income tax payable	12,500	12,600
Accrued expenses payable	7,100	7,500
Mortgage payable (current)	10,400	12,100
Long-term mortgage payable	192,000	180,900
Common stock	10,000	10,000
Retained earnings	101,500	128,000
Liabilities & Stockholders' Equity	<u>\$355,100</u>	<u>\$367,200</u>

Income Statement (Condensed)
For the Year Ending December 31, 0008

Sales revenue*		\$742,600
Cost of sales	\$301,900	
Operating expenses	<u>381,200</u>	
<i>Total Operating Costs</i>		(683,100)
Operating income, before interest and tax		\$ 59,500
Interest expense		(19,400)
Income before tax		\$ 40,100
Income tax		(12,600)
<i>Net Income</i>		<u>\$ 27,500</u>

*Sales revenue consisted of: 22% cash, 64% credit cards, and 14% accounts receivable.

From the information given, calculate the following:

- a. Working capital for Years 0007 and 0008
- b. Current ratio for Years 0007 and 0008
- c. Credit card receivables as a percentage of credit card revenue for Year 0008
- d. Credit card receivables turnover ratio based on credit card revenue for Year 0008
- e. Credit card receivables average collection period ratio, based on credit card revenue for Year 0008
- f. Accounts receivable as a percentage of accounts receivable credit revenue for Year 0008
- g. Accounts receivable turnover ratio based on accounts receivable credit revenue for Year 0008
- h. Accounts receivable average collection period based on accounts receivable credit revenue for Year 0008
- i. Total assets to total liabilities for Years 0007 and 0008
- j. Total liabilities to total assets for Years 0007 and 0008
- k. Total liabilities to stockholders' equity for Years 0007 and 0008.
- l. Net return on total assets for Year 0008
- m. Number of times interest is earned for Year 0008
- n. Net income to total revenue ratio for Year 0008
- o. Return on stockholders' equity for Year 0008
- p. Food inventory turnover ratio for Year 0008
- q. Property, plant, and equipment (fixed assets) turnover ratio for Year 0008

Comment on any of the calculated ratios that appear unusually high or low or totally out of range of what is considered acceptable.

- P4.8** The owners of a cocktail bar have the following annual income statement information:

Annual sales revenue	\$210,000
Cost of sales (30% of revenue)	63,000
Payroll expense	50,000
Other operating expenses	20,000
Direct expenses (charges including depreciation)	40,000

The owners are considering new furnishings for the bar at an estimated cost of \$20,000 using their own funds. They anticipate the new furnishings will bring in additional customers, and their revenue will increase by 10 percent above their current level. The new furnishings are estimated to have a five-year life with no residual value. The new furnishings will be depreciated using straight-line depreciation.

To provide service to the additional customers, more staff would be hired at an additional cost of \$125 per week. Other operating costs will increase by \$1,400 per year. There will be no increase to direct (fixed) charges other than depreciation expense. The income tax rate will remain at 25 percent. The owners will go ahead with the project only if the return on their \$20,000 investment is 15 percent per year or more in the first year.

- a. Should they make the \$20,000 investment in new furnishings?
 - b. If they had the alternative of using only \$10,000 of their own funds and borrowing the other \$10,000 at 10 percent interest, would the decision change?
- P4.9** A restaurant has the following statistical information calculated from its financial statements for the past three years:

	<i>Year 0007</i>	<i>Year 0008</i>	<i>Year 0009</i>
Current ratio	1.04:1	1.25:1	1.40:1
Credit card turnover ratio	70 times	64 times	61 times
Accounts receivable turnover	18 times	24 times	31 times
Food inventory turnover ratio	37 times	28 times	22 times
Total liabilities to total equity	2.75:1	2.4:1	1.95:1
Return on stockholders' equity	9.7%	9.5%	8.7%
Annual revenue	\$875,400	\$881,900	\$879,300

Using this information, answer each of the following questions and explain your answer. A simple yes, no, more, less, or maybe won't do!

- a. Are current assets in relation to current liabilities increasing or decreasing?

- b. Is the restaurant becoming more or less efficient in the collection of its credit card receivables?
- c. Is the restaurant becoming more or less efficient in the collection of its accounts receivable?
- d. Over the three-year period, has more or less money been tied up in food inventory?
- e. With the stockholders' viewpoint in mind, is profitability improving or not improving?
- f. If the restaurant needed to borrow capital through long-term debt, would it be easier to find a lender now than three years ago?
- g. Has the restaurant been using leverage to the advantage of the stockholders over the three-year period?

P4.10 A restaurant has the following statistical information calculated from its financial statements for the past three years:

	<i>Year 0003</i>	<i>Year 0004</i>	<i>Year 0005</i>
Current ratio	1.24:1	1.18:1	1.05:1
Credit card turnover ratio	91 times	93 times	98 times
Accounts receivable turnover	14 times	24 times	31 times
Food inventory turnover ratio	38 times	44 times	48 times
Total liabilities to total equity	1.94:1	2.52:1	2.95:1
Return on stockholders' equity	7.7%	9.6%	9.9%
Annual revenue	\$880,000	\$882,500	\$872,300

Using this information, answer each of the following questions and explain your answer. A simple yes, no, more, less, or maybe won't do! A comment is required in each case.

- a. Are current assets in relation to current liabilities increasing or decreasing?
- b. Is the restaurant becoming more or less efficient in the collection of its credit card receivables?
- c. Is the restaurant becoming more or less efficient in the collection of its accounts receivable?
- d. Over the three-year period, has more or less money been tied up in food inventory?
- e. With the stockholders' viewpoint in mind, is profitability improving or not improving?
- f. If the restaurant needed to borrow capital through long-term debt, would it be easier to find a lender now than three years ago?

- g. Has the restaurant been using leverage to the advantage of the stockholders over the three-year period?

P4.11 A Resort Hotel has 75 guest rooms and a small dining room with 40 seats. The hotel recorded the following information for the month of March.

- Room revenue was \$91,108.
- A total of 1,798 rooms were occupied.
- A total of 3,417 guests are using the 1,798 rooms occupied.
- Dining room food revenue was \$45,209.
- Dining room beverage revenue was \$14,810.
- The dining room serviced a total of 3,720 guests.
- Cost of sales, food was \$18,904.
- Cost of sales, beverage was \$4,805.
- Guest rooms labor costs were \$21,867.
- Dining room labor costs were \$15,011.

Calculate the following for the Resort Hotel:

1. Average rate per room occupied
 2. Rooms occupancy percentage
 3. Room double-occupancy percentage
 4. Food cost percentage
 5. Beverage cost percentage
 6. Rooms labor cost percentage
 7. Dining room labor cost percentage
 8. Total average check, dining room
 9. Dining room average daily seat turnover
 10. Average monthly revenue per dining room seat
 11. Beverage sales revenue to food sales revenue percentage
 12. Beverage sales revenue to rooms sales revenue percentage
 13. Total dining sales revenue to rooms sales revenue percentage
- P4.12** Owners of a catering company also own a number of relatively small coffee shops, one of which shows excellent potential to increase its sales revenue. Selected annual operating figures are

Annual sales revenue	\$370,000
Cost of sales (40% of revenue)	148,000
Payroll expense	103,600
Other operating expenses	74,000

Based on the potential of increasing revenue, the owners are seriously considering a 10-year lease on an adjoining property, which requires a

full 10-year upfront payment of \$96,000. New equipment at a cost of \$20,000 would have to be purchased. The equipment is estimated to have a 10-year life and no residual value. An additional investment in food inventory of \$1,500 would be required.

Revenue is estimated to increase by 20 percent above the present level, and the cost of sales is expected to remain at the current cost of sales percentage. Payroll costs are expected to increase by \$160 per week and other costs by \$150 per week. A minimum 15 percent pretax investment return is wanted by the owners.

1. Should the investment be made?
2. As an alternative, the owners are considering borrowing \$60,000 of the required investment at a 10 percent interest rate. Would the decision change if debt financing were obtained rather than the owners using their funds?

C A S E 4

With reference to the 4C Company's unadjusted trial balance, balance sheet and income statement (Case 2) for the year ending December 31, 2004, calculate each of the following. (This is the first year of 4C Company's operation. When averages are called for but only the beginning number is available, use the ending numbers as shown in the Case 2 financial statement.)

- a. Working capital
- b. Current ratio
- c. Quick ratio
- d. Credit card receivables average collection period (Credit card revenue is 60 percent of total sales revenue.)
- e. Accounts receivable average collection period (Accounts receivable is 10 percent of total revenue.)
- f. Net return on assets
- g. Net income to total revenue ratio
- h. Return on stockholders' equity
- i. Food inventory turnover ratio
- j. Beverage inventory turnover ratio
- k. Cost of sales, food percentage

- I.** Cost of sales, beverage percentage
 - 1.** To conserve cash during the first year of operation, Mr. Driver limited his salary to \$1,500 per month. Explain whether the funds being withdrawn as a salary are considered as a deductible operating expense to the 4C Company?
 - 2.** Prepare a short discussion of each calculated ratio, which you believe may be unsatisfactory, and explain why.
 - 3.** It appears that 4C has a good liquid cash position, and Mr. Driver is considering using \$20,000 of 4C cash to redeem some of his shares of common stock before the final financial statements of the current year are prepared. He asks for your opinion. Recalculate any of the preceding ratios that will be affected by the repurchase of the stock and discuss the effects if the stock repurchase is made.