CHAPTER 6

THE BOTTOM-UP APPROACH TO PRICING

INTRODUCTION

This chapter introduces various pricing methods that have been used in the hospitality industry and points out the need for current, tactical, and long-range pricing methods. In this chapter we discuss in detail the concept of considering net income after tax as a cost in the process of determining product-selling prices. Using net income after tax as a cost is illustrated for a restaurant operation by way of forecasting the average check that will cover all the operation's costs including net income after tax. The illustration continues by showing how an average check per meal period is determined.

This chapter also introduces the subject of pricing individual menu items, and the possible difficulties that may be encountered. The relationship that exists between the sales mix, the average check, and gross margin is discussed, as well as the topics of seat turnover and integrated pricing.

Menu engineering, using a technique of menu analysis that focuses on the contribution margin (gross margin) of each menu item, combined with its popularity, which is measured by customer demand is discussed.

The chapter continues with a discussion of the use of net income after tax as a cost for a rooms operation. The same techniques used to determine the required average check in a restaurant operation would apply to calculating the required average room rate for a hotel or motel operation.

We also look at the approach used to convert an overall average room rate into an average single and double room rate. A different method of determining average room rates, based on the square footage of each type of room, is shown. The relationship between room rates and room occupancy is also discussed.

Room-rate discounting and the use of an equation to calculate the

equivalent occupancy necessary to maintain total revenue (less marginal costs) constant if the rack rate is discounted is illustrated. We look at the use of a potential average room rate as a measuring device, and the establishment of discounted room rates for various market segments. Other pricing considerations such as an organization's objectives, elasticity of demand, cost structure, and competition are also discussed.

This chapter concludes with a section on yield management that matches customers' purchase patterns with their demand for guest rooms. This technique allows ownership to derive a future occupancy forecast with greater accuracy to meet the objective of maximizing room revenues.

CHAPTER OBJECTIVES

After studying this chapter, the reader should be able to

1. Discuss the advantages and disadvantages of various traditional pricing methods used in the hospitality industry and understand the difference between long-range and tactical pricing.
2. Explain the concept of using net income after tax as a cost.
3. Calculate total annual revenue required for a restaurant operation to cover all forecasted costs including net income after tax and convert the annual revenue to an average check amount.
4. Use existing information to calculate an average check per meal period and explain the effect that sales mix of the various menu items will have on the average check.
5. Discuss the considerations to be kept in mind when pricing a menu item and calculate seat turnover figures. Also discuss integrated pricing for a restaurant.
6. Complete a menu engineering worksheet and discuss how to adjust the menu to respond to the results.
7. Calculate an average room rate to cover all forecasted costs, including net income after tax, and convert the average rate to an average single and average double rate.
8. Calculate room rates based on the square footage of a room.
9. Discuss room rate discounting and calculate occupancy percentage for a discount grid. Calculate a potential average room rate and discounted rates for various market segments.
10. Discuss some of the important considerations in pricing, such as the objectives of an organization, elasticity of demand, cost structure, and competition.

THE BOTTOM-UP APPROACH TO PRICING

Generally, *pricing theory* suggests that a hospitality operation should price its rooms and its food and beverage menu items to control costs and maximize profit, while at the same time offering guests an appropriate value for their money. The reasoning behind the pricing theory is that owners should be provided with a satisfactory return on investment if the products being sold are properly priced.

The method used to price products will, to a degree, dictate whether financial goals will be achieved. If prices are too high, customers will come to believe they are not receiving adequate value for their money and seek other sources to provide the product and services. On the other hand, if prices are too low, sales potential is not maximized. In either event, profits can be expected to be lower than they should be.

As will be seen, hospitality operators establish price structures using a number of different methods, each with their advantages and disadvantages.

INTUITIVE METHOD

The intuitive method requires no real knowledge of the business or research into costs, profits, prices, competition, or the market. The operator just assumes that the prices established are the right ones because customers are willing to pay them. This method has no advantages. Its main disadvantage is that the prices charged are unrelated to profits.

RULE-OF-THUMB METHOD

Rule-of-thumb methods (such as that a restaurant should price its menu items at 2.5 times food cost to achieve a 40% cost of sales) may have had validity at one time but should not be relied on in today's highly competitive environment because they pay no attention to the marketplace (competition, value for money, and so forth).

TRIAL-AND-ERROR METHOD

With the trial-and-error method, prices are changed up and down to see what effect they have on sales and profits. When profit is apparently maximized, prices are established at that level. However, this method ignores the fact that there are many other variables (such as general economic conditions, seasonality of demand, and competition) that affect sales and profits apart from prices, and what appears to be the optimum pricing level might later be affected by these other

factors. This method can also be confusing to customers during the price-testing period.

PRICE-CUTTING METHOD

Price cutting occurs when prices are reduced below those of the competition. This can be a risky method if it ignores costs, because if variable costs are higher than prices, profits will be eroded. Some restaurant operators set their food menu prices below costs on the risky assumption they will more than make up the losses by profits on alcoholic beverage sales. To use this method, selling additional products must more than compensate for the reduction in prices. If the extra business gained is simply taken away from competitors, they will also be forced to reduce their prices, and a price war may result.

HIGH PRICE METHOD

Another pricing method is to deliberately charge more than competitors and use product differentiation, emphasizing such factors as quality, which many customers equate with price. If this strategy is not used carefully, however, it can encourage customers to move elsewhere when they realize that high price and high quality are not synonymous.

COMPETITIVE METHOD

Competitive pricing means matching prices to those of the competition and then differentiating in such areas as location, atmosphere, and other nonprice factors. When there is one dominant operator in the market that generally takes the lead in establishing prices, with its close competitors matching increases and decreases, this method is then referred to as the follow-the-leader method. Competitive pricing tends to ensure there is no price-cutting and resulting reduction in profits. In other words, there is market price stability. This might be a useful method in the short run. However, if competitive pricing is used without knowledge of the differences that exist (in such matters as product, costs, and services) between one establishment and another, then this method can be risky.

MARKUP METHOD

The markup method is used, for example, when a restaurant's traditional food cost percentage (as it appears on past income statements) is applied to determine the price of any new menu items offered. For example, if traditionally the restaurant has been operating at a 40 percent food cost, any new menu items offered would be priced so that they also result in a 40 percent food cost. The major problem with this method is that it assumes that 40 percent is the correct food cost for the restaurant to achieve its desired profit.

USING THE RIGHT METHOD

Many of the pricing methods just reviewed are commonly used because operators understand them and find them easy to implement. Unfortunately, if the establishment is not operating as efficiently as it should, these methods simply tend to perpetuate the situation, and sales and profits will not be maximized. Owners or managers who use these methods are not fully in control of their operations and are probably failing to use their income statements and other financial accounting information to guide them in improving their operating results.

Pricing is a tool that can be used effectively to improve profitability. The dilemma is often a matter of finding the balance between prices and profits. In other words, prices should only be established after considering their effect on profits. For example, a restaurant can lower its prices to attract more customers, but if those prices are lowered to the point that they do not cover the costs of serving those extra customers, profits will decline rather than increase.

LONG-RUN OR STRATEGIC PRICING

Over the long run, price is determined in the marketplace as a result of supply and demand. When prices are established to compete in that marketplace, they must be set with the establishment's overall long-term financial objectives in mind. A typical objective could be any one of the following:

- To maximize sales revenue
- To maximize return on owners' investment
- To maximize profitability
- To maximize business growth (in a new operation)
- To maintain or increase market share (for an established operation)

A clearly thought-out pricing strategy will stem from the financial objective or objectives of the business, as well as recognize that these objectives might change over the long run.

TACTICAL PRICING

In addition to a long-run pricing strategy, a hospitality operation needs short-run, or tactical, pricing policies to take advantage of situations that arise from day to day. These situations might include any of the following:

- Reacting to short-run changes in price made by competitors
- Adjusting prices because of a new competitor
- Knowing how large a discount to offer group business while still making a profit
- Knowing how much to increase prices to compensate for an increase in costs

- Knowing how much to increase price to compensate for renovations made to premises
- Adjusting prices to reach a new market segment
- Knowing how to discount prices in the off-season to attract business
- Offering special promotional prices

Many of the remaining chapters in this book are concerned with using accounting-oriented approaches to provide managers with information to help them make decisions about operating cost activities of the operation and to maximize net income and return on investment. However, it is equally important to control sales revenue—that is, to control the prices that are established for the products and services offered. Since there is a relationship between prices charged and total sales revenue, prices will, therefore, affect the general financial results, such as the ability to cover all operating costs and provide a net income that yields an acceptable return on investment. Price levels also affect such matters as budgeting, working capital, cash management, and capital investment decisions—all of which will be discussed in later chapters.

The traditional method of looking at an income statement is from the top down—that is, by calculating sales revenue and the costs associated with that revenue in order to determine if there is a net income. A different approach might be to start with the net income that is required, calculate costs, and determine what sales revenue is required and what prices are to be charged in order to achieve the desired net income. This *bottom-up approach* assumes that net income is a cost of doing business, which indeed it is. If a mortgage company lends money at a particular interest rate to a hotel or food service operation, the interest expense is considered to be a cost. The mortgage company is an investor. Another group of investors are the owners of the company (either stockholders or unincorporated individuals). They also expect interest on their investment of money and/or time, except that their interest is called net income. Therefore, net income is just another type of cost. This concept, and the bottom-up approach to calculating revenue, can be useful in deciding prices.

RESTAURANT PRICING

In general, various components of the income statement can be expressed as a percentage of total sales revenue or as identifiable (known) dollar values. We know that a common-size vertical analysis will allow us to express every element of an income statement as a percentage of total sales revenue. Known dollar values will consist of costs that are considered fixed or repetitive costs that can be estimated with accuracy. The following example illustrates how total sales revenue is required to cover the variable costs and estimated known dollar value costs and to provide operating income (before tax). Breakeven total sales revenue exists when sales revenue is equal to the total operating costs;

thus, there is no profit or loss. The example uses typical restaurant variable cost percentages and a selected few of the typical cost classifications that are fixed or can be estimated with a great deal of accuracy:

Sales revenue			@100%
Total cost of sales (a variable % of total sales revenue)			@ 38%
Labor costs (a variable % of total sales revenue)			@ 25%
Operating costs (a variable % of total sales revenue)			@ 17%
Income before fixed costs			@ 80%
Known Operating Costs			
Management salaries	$38,000		
Administrative expenses	18,000		
Depreciation expense	24,000	20%	
Utilities expense	6,500		
Property taxes expense	4,500		
Total known costs			$91,000
Operating Income			$ -0-

The income statement above shows sales revenue as 100 percent. Other variable costs are identified as a percentage of sales revenue. In this case, cost of sales, labor costs, and other operating costs are identified in total to be 80 percent. Known, nonvariable operating costs have been isolated to be $91,000, or 20 percent of sales revenue (100% − 80%); thus, sales revenue can be found by dividing known costs by the percentage it represents of sales revenue:

Total sales revenue = $91,000 / 20% = $455,000

Having found sales revenue, each variable cost element can be converted to dollars and an income statement can be created.

Sales revenue			$455,000
Total cost of sales, food [38% × $455,000]			(172,900)
Labor costs [25% × $455,000]			(113,750)
Operating costs [17% × $455,000]			(77,350)
Gross Margin			$ 91,000
Known Operating Costs			
Management salaries	$38,000		
Administrative expenses	18,000		
Depreciation expense	24,000	20%	
Utilities expense	6,500		
Property taxes expense	4,500		
Total known costs			$91,000
Operating Income			$ -0-

Building on the techniques of the previous example, the concept of treating net income after tax as a cost will be demonstrated. Let us now consider a 100-seat restaurant whose owner wants to know what sales revenue must be in the coming year. Knowing the total sales revenue objective for the next year allows the calculation of the necessary average check needed to meet the objective for the next year of operation. Information about costs and cost percentages shown in Exhibit 6.1 will be evaluated and incorporated into an income statement

Net income after tax:	A 20% after-tax return on a $220,000 investment in furnishings and equipment is wanted
Income tax rate:	36% of operating income (before tax)
Depreciation rate:	10% of $220,000, the book value of furnishings and equipment

Annual costs

Rent expense	$42,000	Total $92,000
Insurance and license expense	5,400	
Utilities and maintenance expense	6,800	
Administration, office and phone expenses	12,200	
Management salary	25,600	

Variable costs

Cost of sales food, averages 37% of total revenue.
Labor cost percentage averages 27% of total revenue.
Other variable operating costs averages 15% of total revenue.

Return on owner investment:

$$\text{Net Income after tax} = \text{Investment of } \$220{,}000 \times 20\% = \underline{\underline{\$44{,}000}}$$

Calculation of operating income and tax:

$$\frac{\text{NI after tax}}{1 - \text{Tax rate}} = \text{Operating income before tax}$$

$$\frac{\text{NI after tax}}{1 - \text{Tax rate}} = \frac{\$44{,}000}{1 - 0.36} = \frac{\$44{,}000}{0.64} = \underline{\underline{\$68{,}750}}$$

$$\text{Tax} = \text{Operating income before tax} - \text{NI after tax}$$

$$\text{Tax} = \$68{,}750 - \$44{,}000 = \underline{\underline{\$24{,}750}}$$

Alternative calculation of income tax:

$$\text{Operating income (before tax)} \times \text{Tax rate} = \text{Tax}$$

$$\$68{,}750 \times 36\% = \underline{\underline{\$24{,}750}}$$

EXHIBIT 6.1

Projected Restaurant Costs for Next Year

Sales revenue	$Unknown	100%
Cost of sales, food		(37%)
Labor cost		(27%)
Operating costs		(15%)
Total variable cost percentages		79%
Management salary	$ 25,600	
Administration and office expenses	12,200	
Utilities and maintenance expenses	6,800	
Insurance and license expense	5,400	
Rent expense	42,000	
Depreciation expense ($220,000 × 10%)	22,000	
Income tax	24,750	
Net income	44,000	
Total	$182,750 =	21%
Total costs as a percentage of sales revenue		100%

EXHIBIT 6.2

Projected Restaurant Income Statement for Next Year (Incomplete)

using the preceding discussion format in Exhibit 6.2, and a condensed income statement is shown in Exhibit 6.3.

An alternative calculation of income tax is to apply the tax rate to the operating income before tax as follows:

Operating income (before tax) × tax rate = tax: $68,750 × 36% = $24,750

Assuming cost projections are accurate, total annual sales revenue of $870,238 is required to yield a 20 percent after-tax return on the owners' investment next year. Now we can look at total sales revenue of $870,238 in relation to the individual customer. The relationship to total sales revenue is the *average check.*

Sales revenue ($182,750 / 21%)	$870,238
Cost of sales food, labor and other variable costs ($870,238 × 79%)	(687,488)
Contributory income	$182,750
Total operating costs	(114,000)
Operating income (before tax)	$ 68,750
Income tax	(24,750)
Net Income	$ 44,000

EXHIBIT 6.3

Condensed Restaurant Income Statement for Next Year (Complete)

The **average check** will tell us the average amount each customer will spend in the restaurant over the next year to meet our required total sales revenue objective. Assuming the restaurant is open 6 days per week for 52 weeks so operations will be conducted for 312 days (6×52). Also assume the average seat turnover is 2 times per day during the next annual operating year. The equation to calculate the average check is

$$\text{Average check} = \frac{\text{Total annual sales revenue}}{\text{Seats} \times \text{Seat turnover} \times \text{Operating days}}$$

$$= \frac{\$870{,}238}{100 \times 2 \times 312} = \frac{\$870{,}238}{62{,}400} = \underline{\underline{\$13.95}}$$

If we believe faster service can be implemented, it is possible to increase seat turnover from 2 to 2.5 times per day, which, in turn, would decrease the average check from $13.95 to $11.61.

$$\text{Average check} = \frac{\$870{,}238}{100 \times 2.5 \times 312} = \frac{\$870{,}238}{78{,}000} = \underline{\underline{\$11.16}}$$

Regardless of the amount of the average check, it does not tell us what each menu item should be priced at. The average check indicates what each customer on average is expected to spend. The average check does give us an idea of what the pricing structure of the menu should be with a balance of prices—on average, some higher and some lower.

The average check also provides a barometer that allows an evaluation of whether we are achieving the net income objective as the year progresses. If actual spending per customer is less than the level required and all other items such as seat turnover and operating costs have not changed, then we know something must be done to correct the potential net income shortfall.

If seat turnover must be improved, selling prices may have to be raised, costs may have to be decreased, or a combination of these changes may be required. The average check discussed to this point represents an average for all meal periods combined. The next section will discuss average check per meal period.

AVERAGE CHECK BY MEAL PERIOD

Most restaurants serving more than one meal period per day will have an average check that is different for each meal period. As a general rule, the average check will increase from breakfast to lunch and increase again from lunch to dinner. Since there is a variance in the average check per meal period, it would be extremely useful to determine the average check for each meal period served to supplement the total daily average check.

To determine the average check per meal period, it is necessary to know what percentage of total sales revenue and the seat turnover each meal period

is generating. In an ongoing operation, historical records can provide the necessary information; however, a new restaurant will be dependent on management forecasting to obtain the information needed. As an example, we will assume a restaurant has 100 seats and serves lunch and dinner 6 days per week, or 312 days annually. Records indicate that 40 percent of total revenue is from the lunch period, with a 2.5 seat turnover, and 60 percent of total revenue is from the dinner period with a 1.5 seat turnover. To determine the average check per meal period, we will use $870,238 as total sales revenue, using the same equation to find the average check, modified to finding the average check per meal period:

$$\textbf{Average check meal period:}$$

$$= \frac{\textbf{Meal period revenue (\%)} \times \textbf{Total sales revenue}}{\textbf{Seats} \times \textbf{Meal period seat turnover} \times \textbf{Operating days}}$$

The calculation of the average lunch check is

$$\frac{40\% \times \$870{,}238}{100 \times 2.5 \times 312} = \frac{\$348{,}095}{78{,}000} = \underline{\underline{\$4.46}}$$

The calculation of the average dinner check is

$$\frac{60\% \times \$870{,}238}{100 \times 1.5 \times 312} = \frac{\$522{,}143}{46{,}800} = \underline{\underline{\$11.16}}$$

The accuracy of the average checks determined for both meal periods is verified as:

Lunch:

100 seats × 2.5 turnover × $ 4.46 average check × 312 days = $347,880

Dinner:

100 seats × 1.5 turnover × $11.16 average check × 312 days = $522,288

Total sales revenue $870,168

Our original estimated annual sales revenue was $870,238 and the estimated annual sales revenue using the calculated average meal period checks is ($870,238 − 870,168)—$70 less due to rounding of the average checks to the closest cent.

PRICING MENU ITEMS

One of the more common methods used to determine the selling prices of menu items uses a cost percentage. The cost of each menu item is derived from costing the specific ingredients of each menu item to identify a **standard cost** (what

the cost should be) for each menu item. This pricing method can be calculated two different ways to find a selling price based on a cost percentage. As an example, we know from Exhibit 6.2 that 37 percent was the variable food cost of sales as a percentage of sales revenue. To illustrate the use of a 37 percent cost percentage, both methods will be used to set a selling price on a menu item with a cost of $4.00 as follows:

$$\frac{\textbf{Menu item cost}}{\textbf{Cost \%}} = \frac{\$4.00}{37\%} = \underline{\underline{\$10.81}}\ \textbf{Selling price}$$

or **Menu item cost × (1 / 37%) = $4.00 × 2.7 = $10.80 Selling price**

Although the use of a cost percentage is easy to understand and use, it might not be practical to apply the same division or multiplication factors across the board for all menu items. When determining selling prices, the market being serviced must be considered, as well as what potential customers are willing to pay for certain menu items, and what other competitive operations are charging for the same menu item. Setting menu selling prices that are influenced by customers and competitive prices can become a juggling act, causing some selling prices to be set at a cost percentage higher and others and lower than the average cost of sales percentage.

The variety of items people choose from the menu is known as the **sales mix.** In menu pricing, it is a good idea to keep the likely sales mixes in mind since the average check, and ultimately net income, can be influenced by a change in the sales mix. Consider the following table, which shows a sales mix for a fast-food restaurant giving an average check of $4.66:

Menu Item	*Quantity Sold*	*Selling Price*	*Total Revenue*
1	25	$3.00	$ 75.00
2	75	4.00	300.00
3	50	5.00	250.00
4	60	5.00	300.00
5	40	6.00	240.00
Totals	250		$1,165.00

$$\textbf{Average check: } \frac{\$1{,}165.00}{250} = \underline{\underline{\$4.66}}$$

Let us assume that, by promotion or other means, the sales mix was changed; 25 people no longer select menu item #2, five guests switch to menu item #1, and the other 20 guests choose menu item #4. The new sales mix is shown below, with a new higher average check of $4.72. The higher average check would

normally result in a higher gross margin, higher operating income, and higher sales revenue.

Menu Item	*Quantity Sold*	*Selling Price*	*Total Revenue*
1	30	$3.00	$ 90.00
2	50	4.00	200.00
3	50	5.00	250.00
4	80	5.00	400.00
5	40	6.00	240.00
Totals	250		$1,180.00

$$\textbf{Average check: } \frac{\textbf{\$1,180}}{\textbf{250}} = \textbf{\$4.72}$$

The change in sales mixes between the two sales-mix examples above shows an increase in sales revenue of $15. However, it might be more meaningful to see how a changed sales mix affects gross margin rather than average check. Consider the previous two sales results, but with three new columns added—food cost of each menu item, gross margin for each item, and total gross margin for each item, and a total gross margin for total items sold.

Menu Item	*Quantity Sold*	*Food Cost*	*Selling Price*	*Gross Margin*	*Total Gross Margin*
1	25	$1.50	$3.00	$1.50	$ 37.50
2	75	1.75	4.00	2.25	168.75
3	50	2.00	5.00	3.00	150.00
4	60	2.00	5.00	3.00	180.00
5	40	2.50	6.00	3.50	140.00
		Total Gross Margin			$676.25
1	30	1.50	3.00	1.50	$ 45.00
2	50	1.75	4.00	2.25	112.50
3	50	2.00	5.00	3.00	150.00
4	80	2.00	5.00	3.00	240.00
5	40	2.50	6.00	3.50	140.00
		Total Gross Margin			$687.50

In this situation the changed sales mix has resulted in an additional gross margin of $11.25, and, all other things being equal (labor and other direct costs), this will result in the same increase in operating income.

MENU ENGINEERING

Another method of menu analysis is known as **menu engineering.** The term and concept of menu engineering were first introduced in a book by Michael L. Kasavana and Donald J. Smith called *Menu Engineering—A Practical Guide to Menu Analysis* (Lansing, MI: Hospitality Publications, 1982).

To use menu engineering, a worksheet such as that illustrated in Exhibit 6.4 is used. A separate worksheet needs to be used for each meal period, and for each meal period a separate worksheet has to be used for each menu category, such as appetizers, entrees, and desserts. The reason for this is that menu engineering uses each menu item's contribution margin (or gross margin) in the analysis. Wide variations in contribution margin can arise between, for example, appetizers and entree items, and if those contribution margins were compared, no meaningful analysis will be arrived at.

Menu engineering focuses on the contribution margin (or gross margin) of each menu item and combined with its popularity or cusomter demand. Menu engineering ignores the food cost percentage since the contribution margin is assessed in dollars, not percentages. The contribution margin is defined as high or low when compared to the average contribution margin for all items sold. For example, if the average contribution is $6.50 for all items, an item with a contribution margin of $5.50 is considered to be low, whereas an item with a contribution margin of $7.00 is considered to be high.

Similarly, each item's popularity is also defined as either high or low by comparing its sales mix percentage to the average sales mix percentage, that is, the quantity sold of each menu item as a percentage of the total quantity sold of all menu items.

A completed menu engineering worksheet is shown in Exhibit 6.5. A summary of each column or box on this exhibit follows:

Column A—Menu item name: Lists all the items in the menu category being analyzed.

Column B—Number sold (MM): MM stands for menu mix (sales mix). This column records the quantity of each menu item sold for the period being analyzed, with the total of all items sold recorded at the bottom of the column in Box N.

Column C—Menu mix %: Converts the number sold of each menu item from column B into a percentage of all items sold. The quantity sold of each item is divided by the total of all items sold then multiplied by 100. For example, for the first item on the menu, the calculation is

$$\frac{331}{2873} \times 100 = \underline{\underline{11.5\%}}$$

Column D—Item food cost: Lists the food cost for each menu item.

Date: _____

Restaurant: _____ Meal Period: _____

(A) Menu Item Name	(B) Number Sold (MM)	(C) Menu Mix %	(D) Item Food Cost	(E) Item Selling Price	(F) Item CM (E-D)	(G) Menu Costs (D*B)	(H) Menu Revenues (E*B)	(L) Menu CM (F*B)	(P) CM Category	(R) MM% Category	(S) Menu Item Classification	(T) Profit Factor
Column Totals:	N					I = ΣG	J = ΣH	M = ΣL				

Additional Computations:	K = I / J	O = M / N	Q = (100 / Items)(70%)	

EXHIBIT 6.4

Blank Menu Engineering Worksheet

Restaurant: *Pavilion* **Date:** *July 1, 0003*

Meal Period: *Dinner*

(A) Menu Item Name	(B) Number Sold (MM)	(C) Menu Mix %	(D) Item Food Cost	(E) Item Selling Price	(F) Item CM (E-D)	(G) Menu Costs (D*B)	(H) Menu Revenues (E*B)	(L) Menu CM (F*B)	(P) CM Category	(R) MM% Category	(S) Menu Item Classification	(T) Profit Factor
Steak 8 oz.	*331*	*11.5*	*5.50*	*12.95*	*7.45*	*1,821*	*4,286*	*2,466*	*L*	*H*	*plowhorse*	*1.10*
Steak 10 oz.	*295*	*10.3*	*6.80*	*15.95*	*9.15*	*2,006*	*4,705*	*2,699*	*H*	*H*	*star*	*1.21*
Chicken breast	*320*	*11.1*	*3.25*	*7.95*	*4.70*	*1,040*	*2,544*	*1,504*	*L*	*H*	*plowhorse*	*0.67*
Veal neptune	*175*	*6.1*	*5.75*	*12.45*	*6.70*	*1,006*	*2,179*	*1,173*	*L*	*L*	*dog*	*0.52*
Prime rib	*452*	*15.7*	*5.95*	*16.95*	*11.00*	*2,689*	*7,661*	*4,972*	*H*	*H*	*star*	*2.22*
Lamb chops	*307*	*10.7*	*5.70*	*12.95*	*7.25*	*1,750*	*3,976*	*2,226*	*L*	*H*	*plowhorse*	*1.00*
Fried shrimp	*254*	*8.8*	*4.20*	*10.95*	*6.75*	*1,067*	*2,781*	*1,715*	*L*	*H*	*plowhorse*	*0.77*
Sole filet	*314*	*10.9*	*5.05*	*12.45*	*7.40*	*1,586*	*3,909*	*2,324*	*L*	*H*	*plowhorse*	*1.04*
Crab legs	*246*	*8.6*	*6.10*	*13.95*	*7.85*	*1,501*	*3,432*	*1,931*	*H*	*H*	*star*	*0.86*
Salmon steak	*179*	*6.2*	*4.95*	*12.45*	*7.50*	*886*	*2,229*	*1,343*	*L*	*L*	*dog*	*0.60*
	N					**I = ΣG**	**J = ΣH**	**M = ΣL**		**Average CM = M / Menu Items:**		
Column Totals:	*2,873*					*15,352*	*37,702*	*22,353*		*$22,353 / 10 = $2,235*		
Additional Computations:						**K = I / J**		**O = M / N**	**Q = (100 / Items)(70%)**			
						40.7%		*$7.78*	*100 / 10 × 70% = 7.0%*			

EXHIBIT 6.5

Completed Menu Engineering Worksheet

Column E—Item selling price: Lists the selling price of each menu item.

Column F—Item CM (E–D): Records the CM (contribution margin) of each menu item by deducting its food cost (column D) from its selling price (column E). The contribution margin is the amount of money obtained from each item sold to cover all other costs and the profit desired by the operation.

Column G—Menu costs (D × B): Lists the total cost for each menu item sold. It is calculated by multiplying the number sold of each menu item (column B) by its food cost (column D). The dollar amounts in this column of the worksheet have been rounded to the nearest dollar for the sake of simplicity.

Column H—Menu revenues (E × B): Lists the total sales or revenue for each menu item sold. It is calculated by multiplying the number sold of each menu item (column B) by its selling price (column E). The dollar amounts in this column have also been rounded to the nearest dollar for the sake of simplicity.

Box I: Records the total cost of all menu items sold and is the total of column G.

Box J: Records the total sales or revenue generated from all menu items sold and is the total of column H.

Box K = I / J: Used if the overall food cost percentage for the period is desired. It is calculated by dividing the box I total by the box J total and multiplying by 100.

Column L—Menu CM (F × B): Records the total contribution margin (gross profit) for each menu item. It is obtained by multiplying the quantity sold figure (column B) by the contribution margin figure (column F). Alternatively, it can be calculated by deducting the total food cost for each item (column G) from its total revenue (column H). Again, the dollar amounts in this column have been rounded to the nearest dollar for the sake of simplicity.

Box M: Records the total of column L.

Box N: As previously stated, box N records the total of column B.

Box O = M / N: Records the average contribution margin for all items sold. It is obtained by dividing the total contribution margin (box M) by the total number of items sold (box N). The resulting figure in this box is compared to the contribution margin of each individual menu item to determine if its contribution margin is higher or lower than the average contribution margin.

Column P—CM category: Records either an H (for high) or an L (for low) after that item's individual contribution margin is compared with the average contribution margin in box O. If it is higher than the average, an H is recorded; if lower than the average, an L is recorded. For example, the first

menu item has a contribution margin of $7.45 in column F, which is lower than the average of $7.78 in box O, so an L is recorded in column P.

Box Q = (100/items) (70%): Records the average popularity of all menu items. In Exhibit 6.5 there are 10 items on the menu, so average popularity is 100% divided by 10 = 10%. (*Note:* If there were only 5 items on the menu, average popularity would be 100% divided by 5 = 20%, and if there were 20 items on the menu, average popularity would be 100% divided by 20 = 5%).

In our case, the average popularity of each item should be 10 percent of all items sold. However, Kasavana and Smith state that it is unreasonable in practice to expect that every menu item will achieve this minimum level of sales and suggest, based on their experience, that the minimum popularity of each menu item should be only 70 percent of the average popularity number. In our situation, this would be 7 percent (70% × 10%).

Column R—MM% category: Records either an H (for high) or an L (for low). These categories are made by comparing each menu item's menu mix percentage (from column C) with the average of 7 percent from box Q. If the figure from column C is higher than the average, an H is recorded; and if it is less than average, an L is recorded. For example, the first menu item shows 11.5 percent in column C, and this is higher than 7 percent in box Q, so an H is shown in column R.

Column S—Menu item classification: Lists each menu item in one of four categories. There are four possible combinations of letters in columns P and R: HH, LH, HL, and LL. Using the terminology of Kasavana and Smith, the categories are stars, plowhorses, puzzles, and dogs.

- *Stars* are items with both higher than average contribution margin and higher than average popularity; that is, HH items.
- *Plowhorses* have lower than average contribution margin but higher than average popularity; that is, LH items.
- *Puzzles* have higher than average contribution margin but lower than average popularity; that is, HL items.
- *Dogs* have both lower than average contribution margin and lower than average popularity; that is, LL items.

These categories will be discussed in more detail later in the chapter.

Column T—Profit factor: Shows each item's share of the total menu contribution margin. The profit factor is calculated in two steps:

1. Divide the menu's total contribution margin by the number of items on the menu to obtain the average contribution margin per menu item. In our case, the total contribution margin of $22,353 from box M is divided by 10 menu items for an average contribution margin of $2,235.

2. Divide each item's total contribution margin by the average contribution margin to arrive at the profit factor. For example, in Exhibit 6.5, the first menu item shows a total contribution margin of $2,466 in column L. This figure, divided by the average of $2,235 from step 1, results in a profit factor of 1.10, which is recorded in column T.

It is wrong to assume that if an item has a very high profit factor this is good. Because of the way in which profit factors are calculated, the average of all profit factors is 1.0. This means that any profit factors higher than 1.0 have to be balanced by other profit factors lower than 1.0. In other words, the higher some items' profit factors are, the lower others will be.

Thus, the menu will not be a balanced menu, which it would be if all menu items differ only slightly from the average of 1.0. Items that have very high profit factors have to be offset by items with very low profit factors. The operating expenditures for the very low profit factor menu items are generally considered as being wasted. Such expenditures are for purchasing, receiving, storing, issuing, preparation, and service. However, this point of view is far from correct from a marketing point of view. It is important not to lose sight of this; the variance and availability of a balanced menu is not insignificant from the viewpoint of customers.

Stars

Stars are menu items that the restaurant manager would prefer to sell whenever possible. These items should be left on the menu unless there is a good reason to remove them. However, do not be misled by the profitability of the stars if the menu is unbalanced, as indicated by the profit factors showing that too much of the total contribution margin is derived from too few of the menu items. The total contribution margin should be spread more equitably over all menu items or maximized even further by eliminating the low-contribution margin items.

Stars should also be located in the most favorable position on the menu so they continue to be stars. Also, because of their relative popularity, the prices of such items can often be raised without affecting that popularity, thus increasing profits. Generally, stars are the least price sensitive (most inelastic, in economic terms, discussed later in this chapter) items on the menu. Prices of these items should never be reduced because the quantity sold will likely not be affected but total contribution margin will be reduced. On the other hand, if star prices are increased, demand will be little affected and total contribution margin will increase. However, if the demand for stars is more elastic, a price reduction might considerably increase sales (and profits) for these items.

Finally, since stars are the most popular and profitable items on the menu, quality control in their preparation and service is extremely important.

Plowhorses

Plowhorses are items that, though popular with customers, provide a low contribution margin per item. They should generally be kept on the menu, but the restaurant manager should try to increase their contribution margin without affecting demand. Raising their prices is one way to do this. Another way is to review the recipes and purchase specifications with the objective of decreasing the cost of ingredients or reducing the portion size. Alternatively, the contribution margin can be increased by repackaging the item with a side item, and then repricing the package upward. If contribution margin cannot be increased, plowhorses should be relegated to a less favorable position on the menu. Because plowhorses have a low contribution margin, lowering their prices is not a good idea because this will reduce the overall total contribution margin. Favoring these items through improved menu location or server suggestion is also not a good idea because that will simply take business away from more profitable menu items.

The profit factors (from column T of the worksheet) are very important with plowhorses. Some items can, by the high quantity sold, account for significant total contribution margin and, thus, profits. They must be analyzed very carefully.

Puzzles

Puzzles have higher than average contribution margin but lower than average popularity. They are profitable items but do not sell well. Possible reasons for not selling well are that their prices are too high, their quality is not satisfactory, or that they are just not suited to the restaurant's customers. They should generally be kept on the menu, but the restaurant manager should try to increase demand for them by renaming them, making their menu descriptions more appealing, or relocating them to a more favorable position on the menu. Another alternative is to reduce the price, particularly if the item has a relatively high contribution margin and an elastic demand. In other words, sales should be encouraged because such items may be facing price resistance from customers. However, do not reduce the price too much, since this can take business away from the stars and will reduce the contribution margin.

In some cases the price of a puzzle item can be raised, if it is very popular only with a few customers whose demand is inelastic. Increased prices will not affect the demand from these customers, but total contribution margin will increase.

If a puzzle item remains truly unpopular, it should be removed from the menu and replaced by one that a customer survey shows would be much more popular.

Dogs

Dogs have lower than average contribution margin and lower than average popularity. From the restaurant operator's point of view, these are generally the least desirable items to have on the menu. If their contribution margin and/or

popularity cannot be increased, these items should generally be replaced on the menu with new and more popular items that also have a higher contribution margin.

However, sometimes there might be a good reason to retain a dog on the menu. If a dog is popular with a few regular customers, it might be a mistake to take it off the menu. In this case, a price increase might be considered so that it shifts into the puzzle category. Alternatively, over time its popularity may increase shifting it to the plowhorse category.

Recap of Menu Engineering

Menu engineering concentrates on three variables: customer demand (that is, how many customers eat in the restaurant), analysis of the menu items' sales mix to determine the profitability of individual menu items, and item contribution margin (the difference between an item's selling price and its food cost). A menu that provides the highest overall contribution margin is considered the most desirable, and overall food cost percent is not a consideration.

Note that any changes made to a menu as a result of menu engineering should be reviewed after a suitable period of time. If a revised menu produces no more total contribution margin than before, then nothing has been achieved. Total contribution margin can be generally improved by emphasizing the stars to customers, reducing the number of puzzles, and eliminating the dogs.

Finally, a problem with menu engineering is that it is oriented toward maximizing item contribution margin. High contribution margin items usually have not only the highest prices but also the highest food cost percentage. Higher prices can also decrease customer demand and, therefore, profit. However, menu engineering works well when sales revenues are increasing at a good pace, although that is often not the case for many restaurants. Also, below a certain volume of sales, a particular menu item may provide a contribution margin that seems satisfactory but does not cover its total cost.

Because of all the variables (that different menu items must be offered with different prices and different markups, and the facts that gross profit dollars will vary from menu item to menu item, that food cost percentage by itself may not be a meaningful guide in determining selling prices, and that the sales mix must be kept in mind), menu pricing can be a complex task for management.

The comments made in this section on setting food menu selling prices are equally as valid for establishing beer, wine, and liquor prices in a beverage operation.

INTEGRATED PRICING

In pricing food and alcoholic beverages, the manager should also keep **integrated pricing** in mind. This simply means that products should not be priced independently of each other. This is particularly true if the beverage operation

is closely integrated with the food operation: that is, the customers eating in the dining area are the ones who provide most of the business for the beverage operation. In such cases, food and beverage prices should complement each other to achieve profit objectives. Generally, in such a situation, the more food that is sold, the higher beverage sales will be (a concept known as derived demand) and vice versa.

SEAT TURNOVER

Earlier in this chapter, it was stated that one way to offset a declining average check, or average customer spending, is to increase customer counts, or **seat turnover.** Let us look at a case concerning two different restaurants, each with 200 seats.

	Restaurant A		*Restaurant B*	
	Customers	***Seat Turnover***	***Customers***	***Seat Turnover***
Sunday	200	1.00	350	1.75
Monday	250	1.25	350	1.75
Tuesday	350	1.75	350	1.75
Wednesday	350	1.75	350	1.75
Thursday	450	2.25	350	1.75
Friday	550	2.75	450	2.25
Saturday	650	3.25	600	3.00
Week totals:	2,800	14.00	2,800	14.00

Average Daily Customers

$$\textbf{Weekly customers, Restaurant A: Operating days} \quad \frac{2{,}800}{7} = 400 \textbf{ guests per day}$$

$$\textbf{Weekly customers, Restaurant B: Operating days} \quad \frac{2{,}800}{7} = 400 \textbf{ guests per day}$$

Average Daily Turnover

$$\textbf{Weekly turnover, Restaurant A: Operating days} \quad \frac{14}{7} = 2 \textbf{ turns per day}$$

$$\textbf{Weekly turnover, Restaurant B: Operating days} \quad \frac{14}{7} = 2 \textbf{ turns per day}$$

Although the number of customers per week (2,800) and the weekly turnover per week (14) is the same for both restaurants, the distribution of customers on a daily basis during the week is quite different. This type of analysis can be helpful in decisions concerning personnel staffing and advertising as well as seeing where increasing the seat turnover to maintain total sales revenue and protect net income might be compensated for.

ROOM RATES

The approach illustrated earlier in this chapter for determining a required average restaurant check can also be used for calculating **room rates.** Hotel or motel rooms are, however, a different type of commodity from restaurant seats. Restaurant seats can be increased in the short run if you are not already at the maximum capacity allotted by the operation's licenses and the fire code to take care of high demand. Alternatively, service in a restaurant can be speeded up and seat turnover increased to accommodate peak demand periods.

The same cannot be done with guest rooms in a hotel or motel. Supply cannot be increased in the short run. The number of rooms is fixed, and turnover cannot be increased. Apart from selling rooms during the day for meetings or similar uses, the normal turnover rate of a room is once per 24-hour period. In a hotel, only 100 persons can occupy 100 single beds in each 24 hours. In a restaurant, 100, 200, or even 300 persons or more can occupy 100 seats, if the demand is there, during a meal period or day.

One other factor to be considered is that if revenue for a room on a particular night is not obtained, that revenue is gone forever. Room revenue and the fixed cost of providing rooms cannot be recovered if a room is not sold. This differs from food and beverage operations. If food and beverage inventories are purchased by the restaurant and not sold on a particular day, they can be stored for short periods and sold at a later date, and the cost is recoverable. Thus, in determining price we must emphasize the importance of having room rates that permit the fixed costs of providing the space to be recovered and that maximize the occupancy level of the rooms.

THE $1 PER $1,000 METHOD

A method developed many years ago for setting an appropriate room rate is the $1 per $1,000 approach. Since the greatest cost in a hotel or motel property is the investment in building (from 60% to 70% of total investment), it was argued that there should be a fairly direct relationship between the cost of the building and the room rate. From this developed the rule of thumb that for each $1,000

in building cost per room, $1 of room rate should be charged in order for the investment to be profitable. In other words, if a 100-room hotel had a building cost of $4,000,000, its average cost of construction per room is

$$\frac{\$4{,}000{,}000}{100} = \underline{\underline{\$40{,}000}} \text{ per room}$$

Then, for each $1,000 of construction cost per room, there should be $1 of room rate. The *average room rate* would then be:

$$\frac{\$40{,}000}{\$1{,}000} = 40 \times \$1 = \underline{\underline{\$40.00}}$$

This rule of thumb worked under certain circumstances and assumptions. Some of these assumptions were that the hotel was a relatively large one (several hundred rooms), that there was sufficient rent from shops and stores in the building to pay for interest and real estate taxes, that other departments (food, beverages, and so on) were contributing income to the overall hotel operation, and that the average year-round occupancy was 70 percent. These assumptions are all quite specific. Consider the following two small hotel operations: Hotel A, which has no public facilities, and Hotel B, with a more spacious lobby and a dining room/coffee shop and banquet rooms.

	Hotel A	***Hotel B***
Building cost	$2,000,000	$2,600,000
Number of rooms	50	50
Cost per room	$40,000	$52,000
Room rate at $1 per $1,000	$40	$52

Assuming the two properties were in the same competitive market and the $1 per $1,000 rule of thumb were used, Hotel B would find itself at a distinct disadvantage to Hotel A. However, these two competitive properties are, of course, not in the same competitive market because Hotel A has no public facilities.

The $1 per $1,000 rule also leaves room rates tied to historical construction costs and ignores current costs, including current financing costs. The bottom-up approach to room rates overcomes the pitfalls inherent in the $1 per $1,000 method. This bottom-up approach to room pricing is frequently referred to as the Hubbart formula, which was developed some years ago for the American Hotel and Motel Association.

THE BOTTOM-UP APPROACH

The bottom-up approach to room rates is quite similar to that discussed earlier in determining the average check required in a restaurant. We will use the facts illustrated in Exhibit 6.6. The motel has 50 rooms. Note that the cost projections, even though based on information from historical income statements, have been projected to take care of anticipated increases for next year. Our total cost of operating next year is therefore $544,667 as shown in Exhibit 6.7.

Assuming the motel will continue to operate at a 70 percent occupancy, it will sell the following number of rooms per year:

Rooms available	×	Occupancy %	×	365	=	Rooms sold
50	×	70%	×	365	=	12,775 Rooms

Therefore, the **average room rate** will have to be:

$$\frac{\text{Sales revenue required}}{\text{Rooms to be sold}} = \frac{\$529{,}167}{12{,}775} = \$41.42$$

Note that this figure, $41.42, is only the average room rate and is not necessarily the rate for any specific room. Most large hotels have a variety of sizes and types of rooms, each type having a rate for single occupancy and a higher

Net income required	10% after-tax on investment of $550,000 = $55,000
Income tax	40% rate
Depreciation	present book value of building $1,200,000—depreciation rate 5% = $60,000 present book value of furniture and equipment $150,000—depreciation rate 20% = $30,000
Interest	present mortgage payable $750,000 @ 10% = $75,000
Property taxes and insurance	$30,000
Administrative and general	$47,000
Marketing	$25,000
Utilities	$17,000
Repairs and maintenance	$32,000
	Total $121,000
Rooms department operating costs	$137,000 a year for wages, linen, laundry, and supplies. This is based on past income statements at a 70% occupancy.
Coffee shop contributory income	$15,500 a year at 70% rooms occupancy

EXHIBIT 6.6

Motel Cost Projections Next Year

Rooms department operating costs		$137,000
Total overhead costs		121,000
Property taxes and insurance		30,000
Interest		75,000
Depreciation		
Building	$60,000	
Furniture and equipment	30,000	90,000
Income tax		36,667
Net income required		55,000
Total costs		$544,667
Less coffee shop contributory income		(15,500)
Total net costs to be covered by revenue in rooms department		$529,167

EXHIBIT 6.7

Motel Total Cost of Operating Next Year

rate for double occupancy. Motels, even if they have only one size and type of room, have a single rate and a double rate for it.

Where there are multiple types of rooms and multiple rates, the calculated average rate can only be a guide to what the actual rate for each specific type of room will be. Size of room, decor, and view will be some of the factors to consider in arriving at a balance of rates that will both be fair and allow the resulting average rate to work out to the required figure.

Another factor to consider is the rate of double occupancy of rooms. A room that is occupied by two persons has a higher rate than the same room occupied by one person. The higher the proportion of double occupancies, the higher will be the resulting average rates. In our example, a safe way to assure that we achieve at least a $41.42 average would be to make that the minimum single rate for any room. Any rooms we then sell that have a higher single rate, or any rooms sold at the double occupancy rate, would guarantee that our average rate will end up higher than $41.42. Unfortunately, competition and customer resistance may preclude this approach.

In a simple motel situation, with only one standard type of room and all rooms having the same single or double rate, is there a method of calculating what these rates should be? The answer is yes—as long as we decide what the spread will be between the single rate and the double, and as long as we have a good idea of the double-occupancy percentage.

CALCULATING SINGLE AND DOUBLE RATES

To illustrate this, we will use the information about our 50-room motel. We know that $41.42 is the average rate required to cover all costs and give us the return on investment we want. Average occupancy is 70 percent and we know from past

experience the **double-occupancy rate** is 40 percent. To determine the rates, we pick a spread of $10 between the single and the double rates. To clarify, the method of determining a double occupancy percentage is shown as follows:

50 Rooms × 70% × 365 × 140% = 17,885 total guests

The double-occupancy rate is calculated as follows:

Total number of guests during year	17,885
Less number of rooms occupied	(12,775)
Equals number of rooms double occupied	5,110

$$\text{Double-occupancy rate} = \frac{5{,}110}{12{,}775} \times 100 = 40\%$$

A double-occupancy rate of 40 percent in our motel tells us that two or more people occupied 40 percent of all rooms sold. In our motel of 50 rooms, with 70 percent occupancy rate on a typical night, we would have

$$70\% \times 50 = 35 \text{ rooms occupied of which}$$
$$40\% \times 35 = 14 \text{ will be double occupied, and}$$
$$35 - 14 = 21 \text{ will be single occupied}$$

Then

$$\text{Total revenue} = 35 \text{ rooms} \times \$41.42 \text{ average rate} = \$1{,}450$$

The question now is, at what rates can we sell 21 single rooms and 14 double rooms (at a price $10 higher than the singles) so that total revenue is $1,450? Expressed arithmetically, this becomes (with x the unknown single rate):

$$\begin{aligned} 21x + 14(x + \$10) &= \$1{,}450 \\ 21x + 14x + \$140 &= \$1{,}450 \\ 35x &= \$1{,}450 - \$140 \\ 35x &= \$1{,}310 \\ x &= \$1{,}310 / 35 \\ x &= \$37.43 \end{aligned}$$

Therefore, our single rate is $37.43 and our double rate is $47.43 ($37.43 + $10.00). Let us prove the correctness of these rates.

21	Singles	× $37.43	=	$ 786.00
14	Doubles	× $47.43	=	664.00
35	Rooms	× $41.42	=	$1,450.00

The primary purpose of the above equations is to find the single-room rate and to clarify the removal of the double rooms times the spread from day revenue. As a result, an alternative linear equation may be used to calculate the single room rate:

$$\frac{\text{Day revenue} - (\text{Double rooms} \times \text{Spread})}{\text{Rooms sold}} = \text{Single-room rate}$$

$$\frac{\$1{,}450 - (14 \times \$10)}{35} = \frac{\$1{,}450 - \$140}{35} = \frac{\$1{,}310}{35} = \underline{\underline{\$37.43}}\ \text{Single-room rate}$$

These, then, would be the rates under the given circumstances. They are the rates that, given the correctness of our assumptions about next year, we should be charging. They might not be the rates we do charge. Competition, customer resistance, or age of the property may oblige us to reduce them, in which case we will end up with a smaller return on investment than desired. On the other hand, newer establishments in the area with higher construction and operating costs and higher rates, and with customers willing to pay the higher rates, might allow us to increase our rates above our calculated required ones. In this case, we will have a higher return on investment than required.

In trying to determine appropriate room rates, the following factors tend to decrease the average rate:

- Family rates
- Commercial discounts
- Travel agent commissions (unless accounted for separately)
- Convention or group rates
- Special company or government rates
- Weekly or monthly special rates

On the other hand, extra charges for three or more persons in a room would increase the average double-room rate. In addition, special events within the service area might increase room demand beyond the availability of rooms.

ROOM RATES BASED ON ROOM SIZE

One other possible way of determining average rates for different size rooms is to use room's square footage. Let us suppose our motel had two different sizes of rooms: 30 rooms are 220 square feet (including room entranceway, bathroom, and closet areas) and the other 20 rooms are 180 square feet. The demand for each size of room is about equal. Total square footage available for rental:

30 × 220 sq. ft. = 6,600
20 × 180 sq. ft. = 3,600
Total sq. ft. 10,200

Even though there is a total of 10,200 square feet available, we are running at a 70 percent average occupancy. Therefore, each night we expect to sell a total of 35 rooms:

70% × 10,200 = 7,140 square feet

Since we must take in $1,450 a night, on average, to give us the required net income, each square foot sold should produce this revenue:

$$\textbf{Daily rooms revenue: } \frac{\$1{,}450}{7{,}140} = \$0.203$$

Therefore, the average rate that should be charged for our small and large rooms is

Small room 180 sq. ft. × $0.203 = $36.54
Large room 220 sq. ft. × $0.203 = $44.66

We can check the accuracy of these figures. Since there are 20 small rooms and 30 large rooms, 14 small (20 × 70%) rooms and 21 (30 × 70%) large rooms will be sold per day.

14 Small × $36.54 = $ 511.56
21 Large × $44.66 = 937.86
Total revenue per night* = $1,449.42

*Total rooms revenue was rounded earlier to $1,450. The difference between $1,450 and $1,449.42 is $0.58 and is due to rounding.

Note that these average rates for the small and the large size of room must still be converted into single and double rates for each size, using the method illustrated earlier in this chapter.

AVERAGE OCCUPANCY

Earlier in this chapter, it was demonstrated how an analysis of restaurant seat turnover might indicate where the turnover could be increased. A parallel

situation could exist with average room rates and occupancies. Refer to the following:

	Hotel A	*Hotel B*
Saturday	40%	60%
Sunday	40	60
Monday	70	70
Tuesday	90	70
Wednesday	90	80
Thursday	90	80
Friday	70	70
	490%	490%
Average	$\frac{490\%}{7} = 70\%$	$\frac{490\%}{7} = 70\%$

Both hotels have the same average occupancies, but the analysis by day shows a different picture for each. Hotel A has very low occupancy during weekends and very high occupancy during the week. An advertising campaign directed toward bringing in weekend guests would benefit the rooms department and, no doubt, other departments in the hotel. On the other hand, Hotel B has a relatively high weekend business and good, but not high, occupancy during the week. Its advertising should be geared not just toward weekend promotions but also toward improving midweek occupancy.

ROOM RATE DISCOUNTING

Room rate discounting is the practice of reducing prices below the rack rate. The **rack rate** is defined as the maximum rate that will be quoted for a room. Discounting rates for some rooms on any night prevents the hotel from achieving its maximum potential average room rate and maximum potential total revenue for that night. Rooms are typically discounted for groups, such as convention delegates and corporate and government travelers who are regular customers of the hotel. The discounts given are a normal cost of business to maintain occupancy levels, and the reduced room revenue is often compensated for by extra profits achieved from those room guests patronizing the hotel's food and beverage facilities.

Because a hotel's variable costs for each occupied room are relatively low compared to the room rate, a considerable increase in net income results from selling each additional room. For example, if the rack rate for a room is $99, and variable cost is $9, $90 of additional net income is obtained from selling

each extra room that would otherwise stay unoccupied. Theoretically, this hotel could reduce the rate to $10 (let us say) and still make $1 of additional net income. This does not imply that selling all rooms for $10 would be a good long-term decision. In the long term, only those rooms that would otherwise not be sold should have their rates discounted. Before doing any discounting, a hotel should sell all the rooms it can at its highest rate to those customers who are the least price sensitive. When this is achieved, rates should be discounted to obtain business from those who are more price sensitive and should be discounted further to those who are the most price sensitive.

Traditionally, hotels did not operate this way, particularly city hotels that cater to the business traveler whose demand for rooms is primarily during the week, with little or no demand for rooms on weekends. Hotels have reasoned that by offering companies a discounted rate, they would obtain more of that company's business, increase market share, and increase profits. As competitive hotels do the same thing to retain their market share, corporate rates are further reduced by all hotels, and nobody wins. Further, these discounted rates are being offered to the market segment that is the least price sensitive, because the corporate guest is not very concerned about the price of the room since the company pays the bill. However, the corporation may select the hotel their employees can use based on room rates.

The negative effect of this strategy of discounting the corporate rate is often combined with the policy of selling as many rooms as possible to that market segment (in order to retain that business), even when those rooms could be sold at higher rates to other market segments. Therefore, the marketing departments of hotels should use caution when discounting hotel rooms to corporate clients.

DISCOUNT GRID

In reviewing room rates and deciding on the discounts to be offered, it is useful to prepare a **discount grid.** This grid in Exhibit 6.8 shows the impact of various room rate discounts on total room revenue.

To prepare the grid, the marginal (variable) costs of selling each additional room must be known. Normally, marginal costs occur only in the housekeeping department because no extra costs are incurred in the reservations or front office departments to sell an extra room. Housekeeping costs include such items as employee time to clean the room, cost of linen laundering, cost of guest supplies (soap, shampoo, and similar items), and additional utility costs for lighting and heating or air conditioning. For most hotels, marginal costs are easy to determine.

Let us assume that a 110-room hotel's marginal cost for renting each additional room was $10. We can calculate the equivalent occupancy needed to hold

total sales revenue less marginal costs constant if the rack rate is discounted. The equation is:

$$\textbf{Equivalent occupancy} = \textbf{Original occupancy} \times \frac{\textbf{Rack rate} - \textbf{Marginal cost}}{\textbf{[Rack rate} \times \textbf{(1} - \textbf{Discount percentage)]} - \textbf{Marginal cost}}$$

Assume that all the hotel's rooms have the same rack rate of \$80 and that the hotel currently operates at 70 percent occupancy. If rates were discounted by 10 percent, the equivalent occupancy required (using the equation) would be:

$$70\% \times \frac{\$80 - \$10}{[\$80 \times (1 - 10\%)] - \$10}$$

$$= 70\% \times \frac{\$70}{(\$80 \times 90\%) - \$10}$$

$$= 70\% \times \frac{\$70}{\$72 - \$10}$$

$$= 70\% \times \frac{\$70}{\$62}$$

$$= 70\% \times 1.13 = \underline{\underline{79.1\%}}$$

This can be proved. Nightly room revenue before discounting is

70% occupancy × 110 rooms × \$80 rack rate = \$6,160

Total marginal costs = 70% occupancy × 110 rooms × \$10 = \$770

Net revenue = \$6,160 − \$770 = \$5,390

After discounting, nightly revenue at 79.1 percent occupancy will be

79.1% occupancy × 110 rooms × \$72 rate = \$6,265

Total marginal costs = 79.1% occupancy × 110 rooms × \$10 = \$870

Net revenue = \$6,265 − \$870 = \$5,395.

In other words, net revenue (total sales revenue less marginal costs) is the same as before. The small difference is due to rounding.

Similar calculations can be made for various occupancy levels and discount percentages and the results can be tabulated in a grid such as that in Exhibit 6.8. Once this has been done, the grid shows the equivalent occupancy that must be achieved to maintain room revenue (less marginal costs) at a stipulated level as

New Occupancy Level Necessary to Maintain the Same Current Profitability if an $80 Rack Rate* with a Marginal Cost of $10 Is Discounted:

	Discount			
Occupancy	***5%***	***10%***	***15%***	***20%***
70%	74.2%	79.1%	84.7%	91.0%
65%	68.9%	73.5%	78.7%	84.5%
60%	63.6%	67.8%	72.6%	78.0%
55%	58.3%	62.2%	66.6%	71.5%
50%	53.0%	56.5%	60.5%	65.0%

*This discount grid serves only for an $80 rack rate.

EXHIBIT 6.8
Discount Grid

discounts are increased or decreased. Thus, the grid allows management to make sensible pricing decisions.

For example, the grid shows that if the hotel discounts room rates by 15 percent and its current occupancy is 70 percent, the equivalent occupancy after discounting would have to be 84.7 percent. In our 110-room hotel, this means that, on average, an additional 16.2 rooms would have to be sold per night. If advertising is used to sell the extra 16.2 rooms, this cost must be considered, as would any additional revenue that the added guests might provide in the food and beverage departments. In other words, the grid should be used only as an aid in decision making and not be the only criterion.

POTENTIAL AVERAGE ROOM RATE

The potential average room rate is defined as the average rate that would result if all rooms occupied overnight were sold at the rack rate without a discount.

To this point, we have stated that the rack rate is the maximum rate that will be charged for a room. But in fact, most hotels have two or more rack rates for each room. There may be a rack rate for single occupancy, a rack rate for double occupancy, and even a rack rate for occupancy by three or more. How can a potential average room rate be determined in such a situation?

If a hotel sold all its rooms at single occupancy, its potential average rack rate would be the average rate if all rooms were single occupied. If the hotel sold all its rooms at double occupancy, its potential average rate would be the average rate if all rooms were double occupied. For most hotels, neither of these extremes is likely. For most properties on a typical night, some rooms will be single occupied and others will be double occupied. A further complication is that there may be different types of rooms, whose single or double rack rates

are different. Thus, the potential average rate must be calculated by taking the hotel's normal sales mix into consideration.

To illustrate, assume that if all of a 90-room hotel's various rooms were each occupied by one person (single occupancy) at the maximum single occupancy rack rate, total sales revenue would be $6,750. Potential minimum average rate is therefore:

$$\frac{\$6{,}750}{90} = \underline{\underline{\$75}}$$

On the other hand, if all 90 rooms were double occupied at the maximum double-occupancy rack rate, total sales revenue would be $7,650. Potential maximum average rate is therefore:

$$\frac{\$7{,}650}{90} = \underline{\underline{\$85}}$$

(Note that if the hotel has suites or special rooms at higher rates, these can be included in the maximum potential double rate.)

The difference between $85 and $75 is known as the *rate spread.* If this hotel's percentage of double occupancy were 40 percent (i.e., 40% of all rooms occupied are occupied by two people), the potential average room rate can be calculated as follows:

Potential average single rate + (Double occupancy % × Rate spread)

In our case, this results in a potential average room rate of

$$\$75 + (40\% \times \$10.00) = \$75 + \$4 = \underline{\underline{\$79}}$$

COMPARING ACTUAL AVERAGE TO POTENTIAL AVERAGE

Once the potential average room rate has been calculated, the hotel can compare its actual rate to this potential each day or each period. There may be occasions when the actual rate will be higher than the potential. This could occur when the double occupancy rate exceeds the normal 40 percent and/or if additional charges are made for a third person in a room and/or if front desk employees are doing a good job of selling the most expensive rooms first.

In other cases, the actual average rate will be below the potential rate and can be measured by dividing it by the potential rate and converting to a percentage to arrive at the average rate ratio. For example, if the actual rate achieved during a particular week were $69, the percentage would be

$$\frac{\$69}{\$79} \times 100 = \underline{\underline{87.3\%}}$$

This means the hotel achieved only 87.3 percent of its potential average rate. This could occur because the double occupancy ratio fell below normal and/or because the front desk employees did a poor job and sold the lower-priced rooms first. Alternatively, all other factors being equal, it means that rack rates had been discounted 12.7 percent on average.

ROOM RATES FOR EACH MARKET SEGMENT

With reference to the $79 potential average room rate calculated earlier, it is possible to calculate the room rate for each type of market (market segment) with which the hotel deals. Suppose we have the following information for each of three segments:

Market Segment	*Annual Room Nights*	*Percentage*	*Rack Rate (%)*
Business travelers	5,110	40%	100%
Conference groups	4,471	35	90
Tour groups	3,194	25	80
	12,775	100%	

The percentage column figures show how much of total business each segment produces. For example, business travelers constitute 40 percent of total room nights (5,110 / 12,775 × 100). The rack rate column tells us the percentage of the rack rate that we are going to charge customers in that market segment. For example, business travelers are going to pay 100 percent of the rack rate (and receive no discount), whereas conference groups will be charged 90 percent of the rack rate (or receive a 10% discount), and tour groups 80 percent of the rack rate (or receive a 20% discount). What must those rates be to ensure that we continue to achieve a $79 average room rate?

We must first calculate what the new potential average rack rate is going to be for the business travelers who receive no discount. We know that it will be higher than before because some segments are going to receive a discounted rate, and thus the new rack rate must increase to compensate for these discounts. The calculation is made by weighting the discount percentage for each market segment and, at the same time, taking into account the percentage of business that each market segment generates, as follows:

$$\frac{\$79}{(40\% \times 100\%) + (35\% \times 90\%) + (25\% \times 80\%)}$$

Note that, in each set of parentheses in the denominator, the first figure represents the portion of the business provided by that segment and the second represents the rack rate percentage for that segment. For example, in the first set

of figures the business travelers provide 40 percent of the business at the full rack rate. Following through on the calculations, we have:

$$\frac{\$79}{40\% + 31.5\% + 20\%} = \frac{\$79}{91.5\%} = \underline{\underline{\$86.34}}$$

The discounted rates for the other segments are:

Conference groups $\$86.34 \times 90\% = \underline{\underline{\$77.71}}$

Tour groups $\$86.34 \times 80\% = \underline{\underline{\$69.07}}$

We can prove that these rates will generate the sales required to yield our desired potential average room rate:

Market Segment	*Room Nights*	×	*Average Rate*	=	*Total Sales*
Business travelers	5,110	×	$86.34	=	$ 441,197
Conference groups	4,471	×	77.71	=	347,441
Tour groups	3,194	×	69.07	=	220,610
Totals	12,775				$1,009,248

$$\frac{\$1{,}009{,}248}{12{,}775} = \underline{\underline{\$79.00}}$$

OTHER PRICING CONSIDERATIONS

The method demonstrated in this chapter for determining meal selling prices and room rates to ensure an adequate return on investments has its shortcomings. So does the markup (also called cost-plus pricing) method used in conjunction with establishing food and beverage prices relative to the cost of food and beverage ingredients. Both the return on investment and markup methods are simple and easy to use, but because of their simplicity, they ignore many other factors that must be taken into consideration in establishing prices. For that reason, return on investment and markup pricing should be used as reference points only and should not be the only determinants in setting final prices.

In addition, assumptions are made about room occupancy rates (in a hotel situation) and seat turnover (in a restaurant situation). However, adjustments can

be made to prices during the actual period when it is seen that rooms occupancy and/or seat turnovers differ from those used in the initial calculations.

Unfortunately, the revised decisions may be the reverse of those that should be made under the circumstances. To illustrate, consider the situation of a hotel that had based its average room rate of $79 for next year on a predicted occupancy of 70 percent. During the year, it is seen that actual occupancy is closer to 65 percent, and, therefore, the average room rate is revised upward to compensate so that the desired profit (operating income) will still be achieved.

However, when you consider a typical business situation, a price increase will often result in a further decrease in demand for rooms, reducing occupancy still further. In normal economic situations (i.e., when all other things are equal), the correct thing to do to stimulate demand is to lower prices as demand decreases and, therefore, net income.

If wrong decisions are made as a result of blindly using a bottom-up pricing approach, empty hotel rooms and empty restaurant seats (and thus, reduced profit) will probably result. Similarly, there may be missed profit opportunities because prices could be raised above those calculated using the markup method when market conditions are such that customers are prepared to pay those higher prices.

Markup pricing can work during periods of low inflation (as long as economic activity is not declining at the same time) and when there is not an oversupply of hotel rooms or restaurant seats (that is, when there is not a particularly acute competitive situation). However, it is rare for this situation to prevail, and for that reason many hotels have begun to employ more sophisticated methods that systematically take into consideration all the relevant factors that should be considered in the pricing decision. One of these less simplistic approaches is yield management (to be discussed later in the chapter).

Some of the other considerations in pricing are discussed in the following sections.

ELASTICITY OF DEMAND

Elasticity of demand is related to the responsiveness of demand for a product or service when prices are changed. A large change in demand resulting from a small change in prices is referred to as *elastic demand.* A small change in demand following a large change in prices is referred to as *inelastic demand.* The following is an equation for calculating the elasticity of demand:

$$\frac{\textbf{Change in quantity demanded / Base quantity demanded}}{\textbf{Change in price / Base price}}$$

For example, suppose a hotel sold 2,000 rooms during the past month at an average rate of $70. For the following month the room rate was increased by $7

to $77. As a result, during the next month 1,900 rooms were sold—a decrease of 100. Placing these numbers in the equation, we have

$$\frac{\textbf{100 / 2,000}}{\textbf{\$7 / \$70}} = \frac{\textbf{.05}}{\textbf{.10}} = \underline{\underline{\textbf{0.5}}}$$

If the calculations show that the elasticity of demand is less than 1, then the demand is said to be inelastic. If the result is more than 1, then demand is elastic. In our case, demand is inelastic because even though the price increase caused fewer rooms to be sold, total revenue nevertheless increased.

Month 1: **2,000 rooms × \$70 = \$140,000**

Month 2: **1,900 rooms × \$77 = \$146,300**

Thus, the easiest way to test whether demand is elastic or inelastic is to note what happens to total sales revenue when prices are changed. If demand is elastic, a decline in price will result in an increase in total sales revenue because, even though a lower price is being received per unit, enough additional units are now being sold to more than compensate for the lower price.

A generalization is that, if demand is elastic, a change in price will cause total sales revenue to change in the opposite direction. If demand is inelastic, a price decline will cause total sales revenue to fall. The small increase in sales revenue that occurs will not be sufficient to offset the decline in sales revenue per unit. Again, one can generalize and say that, if demand is inelastic, a change in price will cause total sales revenue to change in the same direction.

One of the factors that influences elasticity of demand is the availability of substitutes. Generally, hospitality businesses that charge the highest prices are able to do so because there is little substitution possible. An elite hotel with little competition can charge higher room rates, since its customers expect to pay higher rates and can afford to do so, and generally would not move to a lower-priced, less luxurious hotel if room rates were increased. Demand is inelastic.

On the other hand, a restaurant that is one of many in a particular neighborhood catering to the family trade would probably lose considerable business if it raised its menu prices out of line with its competitors. Its trade is very elastic. Its price-conscious customers would simply take their business to another restaurant. Alternatively, a high-average-check restaurant will probably find less customer resistance to an increase in menu prices. In general, one can say, therefore, that the lower the income of a business's customers, the more elastic is their demand, and vice versa.

Closely related to income levels are the habits of a business's customers. The more habit prone the customers are, the less likely are they to resist some upward change in prices, since customers tend to have "brand" loyalties to

hotels and restaurants, just as they have with other products they buy. Enterprises that need to count on repeat business must be very conscious of the effect that price changes may have on that loyalty. Note, also, that the demand for a product or service tends to be more elastic as the time under consideration increases. Even though customers are creatures of habit and do develop loyalties, those habits and loyalties can change over time.

Each separate hospitality enterprise must, therefore, be aware of the elasticity of demand of the market in which it operates and of the loyalty of its customers. In other words, it must have a market-oriented approach to pricing. This market orientation is particularly important in short-run decision making, such as offering reduced weekend and off-season room rates to help increase occupancy, or special food and beverage prices during slow periods. These reduced rates or prices are particularly appropriate where demand is highly elastic.

COST STRUCTURE

The specific cost structure of a business is also a major factor influencing pricing decisions. Cost structure in this context means the breakdown of costs into fixed and variable ones. Fixed costs are those that normally do not change in the short run, such as a manager's salary or insurance expense. Variable costs are those that increase or decrease, depending on sales volume. An example is food cost.

A business with high fixed costs relative to variable ones will likely have less stable profits as the volume of sales revenue increases or decreases. In such a situation, having the right prices for the market becomes increasingly important. In the short run, any price in excess of the variable cost will produce a contribution to fixed costs and net income, and the lower the variable costs, the wider is the range of possible prices. For example, if the variable, or marginal, costs (such as housekeeping wages, and linen and laundry expense) to sell an extra room are $10, and that room normally sells for $95, any price between $10 and $95 will contribute to offsetting fixed costs and increasing net income. In such a situation, those who establish prices have at their discretion a wide range of possibilities for imaginative marketing and pricing to bring in extra business and maximize sales revenue and profits (operating income).

Note that this concept of variable or marginal costing is only valid in the short run. Over the long run, prices must be established so that all costs (both fixed and variable) are covered in order to produce a long-run net income.

The subject of fixed and variable costs is covered in some depth in Chapter 7, Cost Management, and Chapter 8, The Cost-Volume-Profit Approach to Decisions. In particular, in Chapter 8, the use of the breakeven equation is demonstrated in conjunction with the effect a change in room rates has on volume and profits.

COMPETITION

A hospitality enterprise's competitive situation is also critical in pricing. Very few hospitality businesses are in a monopolistic situation (although some are, such as a restaurant operator who has the only concession at an airport).

Where there is a monopolistic or near monopolistic situation, the operator has greater flexibility in determining prices and may indeed tend to charge more than is reasonably fair. However, in these situations the customer still has the freedom to buy or not buy a meal or drink, or to stay fewer nights in that accommodation. Also, in a monopolistic situation where high prices prevail, new entrepreneurs are soon attracted to offer competition.

In a more competitive, but not completely competitive situation, there often exists an oligopoly. In an oligopoly, there tends to be one major or dominant business and several smaller competitive businesses. In an oligopoly the dominant business is often the price leader. When the price leader's prices are raised or lowered, the prices of the other businesses are raised or lowered in tandem. An oligopolistic situation could arise in a resort area where there is one major resort hotel, surrounded by several other motels catering to customers with a slightly lower income level.

However, most hospitality enterprises are in a purely competitive situation where the demand for the goods and services of any one establishment is highly sensitive to the prices charged. In such situations there is little difference, from a price point of view, between one establishment and the next. Where there is close competition, competitive pricing will often prevail without thought to other considerations. For example, an operator practicing competitive pricing may fail to recognize that his or her particular product or service is superior in some ways to that of competitors and could command a higher price without reducing demand.

In a highly competitive situation, an astute operator will look at the strengths and weaknesses of his or her own situation, as well as those of the competitors. In analyzing strengths and weaknesses, operators should try to differentiate themselves and their products and services from their competitors'. The establishments that are most successful in differentiating have more freedom in establishing their prices. This differentiation can be in such matters as ambience and atmosphere, decor, location, view, and similar factors. Indeed, with differentiation, psychological pricing may be practiced. With psychological pricing the prices are established according to what the customer expects to pay for the "different" goods or services offered. The greater the differentiation, the higher prices can be set. For example, this situation prevails in fashionable restaurants and exclusive resorts, where a particular market niche has been created. At this point, a monopolistic or near monopolistic situation may again prevail.

In summary, then, there is no one method of establishing prices for all hospitality enterprises. Each establishment will have somewhat different long-run

pricing strategies related to its overall objectives and will adopt appropriate short-run pricing policies depending on its cost structure and market situation.

YIELD MANAGEMENT

The hospitality industry has recently adopted a practice called **yield management.** Using calculated yield statistics and basic principles of supply and demand, managers seek to allocate services to patrons in such a way as to maximize sales revenue.

HOTEL PRACTICES

The main goal of the rooms department in many hotels is to sell hotel rooms to increase the occupancy percentage. Management's objective is to maximize the sales revenue (or yield) from the rooms available. Unfortunately, many of the methods used to measure a hotel's marketing effort do not generate sales decisions that maximize revenue. Traditionally, marketing effort has been judged in terms of either the occupancy percentage or the average room rate achieved.

The problem with occupancy percentage is that it does not show whether sales revenue is being maximized. For example, a hotel may be 100 percent occupied, but many of those room occupants might be paying less than the maximum (rack) rate for the room. In other words, managers whose performance is measured by room occupancy are tempted to increase occupancy at the expense of room rate.

Other managers are judged by the average room rate. Again, the average room rate can be increased by refusing to sell any rooms at less than the rack rate, turning away potential customers who are unwilling to pay this rate. Average room rate will be maximized at the expense of occupancy. Average room rate can be slightly more meaningful if it is expressed as a ratio of the maximum potential average rate, as discussed in an earlier section of this chapter, but by itself, it does not provide a complete picture.

Instead of focusing on a high occupancy or a high average rate, a better measure of a manager's performance is the **yield statistic:**

$$\textbf{Yield} = \frac{\textbf{Actual revenue}}{\textbf{Potential revenue}} \times \textbf{100}$$

Potential revenue is defined as the room sales that would be generated if 100 percent occupancy was achieved and each room was sold at its maximum rack rate. For example, if a hotel has 150 rooms, each of which has a maximum

rack rate of $100, potential sales revenue is 150 × $100 = $15,000, and if actual sales revenue on a particular night is $10,000, then yield is

$$\frac{\$10{,}000}{\$15{,}000} \times 100 = \underline{\underline{66.7\%}}$$

Yield thus combines two factors: the number of rooms available (inventory) and rooms pricing. Rooms inventory management is concerned with how many rooms are made available to each market segment and its demand for rooms. Pricing management is concerned with the room rate quoted to each of these market segments.

Note that there can be different combinations of room rates and occupancies that achieve the same yield percentage. For example, consider the following three situations that show various combinations that generate the same actual revenue, and thus the same yield percentage:

Case A **100 rooms occupied × $100.00 average rate = $10,000**

Case B **120 rooms occupied × $ 83.33 average rate = $10,000**

Case C **140 rooms occupied × $ 71.43 average rate = $10,000**

In each of these three situations, if potential sales revenue was $15,000, the yield will be the same: 66.7 percent. However, even though each of these situations is equal insofar as total sales revenue and yield percentage are concerned, they may not be equal in terms of other factors. On one hand, in Cases B and C there are more rooms occupied than in Case A; thus, there will be additional housekeeping and energy costs. On the other hand, Cases B and C also mean more guests in the hotel who are likely to patronize and increase sales revenue in food and beverage areas. Further, if those additional customers are first-time guests of the hotel and leave with a favorable impression, they are likely to be repeat customers and will provide positive word-of-mouth advertising, thus increasing future sales revenue.

Finally, note that because the yield statistic is a combination of occupancy percentage and average room rate, it can also be calculated by multiplying the actual occupancy percentage by the average rate ratio. The average rate ratio is the actual average rate expressed as a percentage of the average maximum potential rate. In our 150-room hotel, the maximum average potential rate is $100 ($15,000 potential maximum revenue divided by 150 rooms). Yields for the three cases can be calculated as follows:

$$\text{Yield} = \frac{\text{Rooms occupied}}{\text{Potential rooms}} = \frac{\text{Average rate}}{\text{Maximum rack rate}}$$

Case A:

$$\frac{100}{150} \times \frac{\$100}{\$100}$$

$$= 66.7\% \text{ occupancy} \times 1.0 \text{ average rate ratio}$$

$$= \underline{\underline{66.7\%}} \text{ yield}$$

Case B:

$$\frac{120}{150} \times \frac{\$83.33}{\$100}$$

$$= 80\% \text{ occupancy} \times 0.8333 \text{ average rate ratio}$$

$$= \underline{\underline{66.7\%}} \text{ yield}$$

Case C:

$$\frac{140}{150} \times \frac{\$71.43}{\$100}$$

$$= 93.33\% \text{ occupancy} \times 0.1743 \text{ average rate ratio}$$

$$= \underline{\underline{66.7\%}} \text{ yield}$$

Even though the occupancy percentage and the average rate ratio by themselves do not provide complete information, by multiplying them together to provide the yield percentage, a single integrated statistic is produced that is much more meaningful and is a more consistent measure of a hotel's performance.

The objective of yield management is to maximize hotel room revenue by using basic economic principles to allocate the right type of room to the right type of guest at a price the guest is prepared to pay. The concept of maximizing sales revenue is not new. Indeed, hotel managers have always known that during slow periods they can increase the demand for rooms by looking at the number of reservations they already have for future periods and then reducing the prices of still-available rooms to stimulate further demand. Conversely, during high-demand periods when occupancy will be at or near 100 percent, they can increase room rates, knowing that customers are prepared to pay higher rates in order to guarantee a reservation. Most hotel operators have traditionally used this concept of supply and demand in their pricing.

When a hotel's sales manager contracts with a conference group at a room rate lower than that for transient guests, the manager is practicing a form of yield management. Similarly, offering lower transient rates on weekends than during the week is another form of yield management, as is refusing to discount any rates below the rack rate during the peak vacation period. However, it is important for management to go beyond these ad hoc room rate pricing methods to obtain the full benefits of yield management. For example, it has been a

common practice for hotels to stop accepting reservations for those days when reservations have reached a certain level. As a result of subsequent cancellations and no shows, empty rooms result. These "spoiled" rooms could have been filled if extra reservations had been taken. A good yield management system can track the level of these spoiled rooms and indicate when extra reservations should be accepted, thus increasing room revenue and increasing guest satisfaction because customers who would otherwise have their reservations declined are able to stay at their hotel of choice. A computerized yield management system can also indicate how much additional sales revenue was produced as a result of management decisions based on yield management.

Traditionally, many hotels have quoted a rate (usually the highest, or rack rate) to inquiring customers and have then reduced this quoted rate (sometimes several times) as the customer shows resistance. Hotels that practice this will end up with a declining average rate because of the high number of rooms sold at a discount. This strategy has little to do with rational yield management. In addition, there will be increasing customer dissatisfaction, as guests realize that by offering further resistance they could have obtained an even lower rate.

COMPUTER APPLICATIONS

Computerized spreadsheet programs can be extremely useful in making pricing decisions because they can so rapidly perform the calculations in what-if situations that would take hours to produce if done manually.

For example, a variety of room rates can be entered in the computer, along with an assumed occupancy percentage for each separate room rate. For each room rate and occupancy percentage, the expected level of variable expenses can also be entered. The computer can then calculate the total sales revenue and anticipated departmental profit (operating income) for each possible situation to provide management with information about which average room rate is the most profitable. More sophisticated programs can also predict what effect each room rate and occupancy level will have on other departments, such as food and beverage.

A spreadsheet program can also easily handle the calculations necessary for such things as average checks, seat turnovers, menu gross profit, the Hubbart formula, and a discount grid as illustrated in Exhibit 6.8.

Spreadsheets or special menu engineering software packages can be used to eliminate the extensive time necessary to produce the worksheets manually. Only each item's cost, selling price, and menu mix have to be entered, and all of the remaining calculations are automatically performed and printed out.

Finally, as mentioned earlier in this chapter, there are special yield management software packages on the market today that can be used to implement a yield management system.

SUMMARY

This chapter introduced the reader to various pricing methods that have been used in the hospitality industry. It pointed out the need for both long-range and tactical pricing approaches. The usual way of looking at an income statement is to deduct costs from sales revenue, and call any excess of sales revenue over costs net income. However, if net income (after tax) is considered as a cost, it can then be budgeted for like any other cost; and the required revenue that must be realized to cover all costs, including net income after tax, can be calculated in advance each month, quarter, or year.

Once it has been calculated for a restaurant, this figure permits us to calculate average check or average customer spending. This is calculated as follows:

$$\textbf{Average check} = \frac{\textbf{Total sales revenue}}{\textbf{Seats} \times \textbf{Seat turnover} \times \textbf{Operating days}}$$

The overall average check can be further broken down by meal period by using the following equation:

$$\textbf{Meal period average check} = \frac{\textbf{Meal period revenue}}{\textbf{Seats} \times \textbf{Seat turnover} \times \textbf{Operating days}}$$

The average check is only an average and not the price of every item on the menu. Menu pricing of individual items can be a complex problem for management, requiring consideration of a great number of factors. Factors considered include the menu price ranges needed to accommodate clientele; gross margin of different menu items; and pricing of the competition. It is important to evaluate the influence the menu sales mix can have on the average check as well as the effect on gross margin and net income.

The effect that seat turnovers can have on total sales revenue should never be ignored. Increasing seat turnover can compensate for a declining average check.

Menu engineering is a method of menu analysis that combines each menu item's contribution margin (gross profit) with its popularity or the demand for that item by the restaurant's customers. Menu items are then classified into one of four categories—stars, plowhorses, puzzles, and dogs—decisions can be made about how to change the menu.

The average room rate required for a hotel or motel to cover all costs, including net income, can be calculated in a way similar to the calculation of average check for a restaurant. The equation is:

$$\textbf{Average room rate} = \frac{\textbf{Total sales revenue}}{\textbf{Rooms} \times \textbf{Occupancy \%} \times \textbf{Operating days}}$$

The average room rate, like the average check, is only an average and not necessarily the rate for any classification of rooms. Normally, the average room rate is broken down into an average rate for single rooms and average rate for double rooms. Room rates are also calculated based on the square footage of rooms with different sizes. Total room revenue is a combination of average room rate and actual room occupancy. Therefore, one should keep in mind the occupancy of rooms by day of the week, because declining room rate can be compensated for by increasing room occupancy, and vice versa.

In room rate discounting, an equation can be used to calculate the equivalent occupancy needed to hold total sales revenue less marginal costs constant if the rack rate is discounted. The equation to calculate the equivalent occupancy is:

$$\text{Equivalent occupancy} = \text{Original occupancy} \times \frac{\text{Rack rate} - \text{Marginal cost}}{[\text{Rack rate} \times (1 - \text{Discount \%})] - \text{Marginal cost}}$$

A potential average room rate can be compared with the actual average. Once a potential average rate has been calculated, it can be used to establish discounted room rates for various market segments.

Note that both the return on investment method and the markup method of establishing prices should be used primarily as reference points in establishing actual prices. There are several other considerations to be kept in mind. For example, prices must be established to meet the organization's long-run objectives. In addition, factors such as the elasticity of demand, the business's cost structure (breakdown between fixed and variable costs), and the competitive environment in which it operates are all very important factors.

Most hotels measure their rooms department's effectiveness by using either occupancy percentage or average rate, both of which have shortcomings. An alternative is to use the yield statistic, which is a combination of occupancy percentage and average rate. The chapter concluded with a section on yield management, a method of matching customers' purchase patterns and their demand for guest rooms to derive more precise occupancy forecasts, with the objective of maximizing room's revenue.

DISCUSSION QUESTIONS

1. Discuss the advantages and disadvantages of the three traditional pricing methods used by the hospitality industry.
2. Differentiate long-run from tactical pricing and list four events that might necessitate tactical pricing.
3. Explain why net income (after tax) can be treated as another cost of running a business operation.
4. Explain how forecasted (budgeted) revenue for a hospitality operation can be used to determine an average check and an average room.

5. If an average check was established to support a specific level of total sales revenue in a restaurant and the seat turnover rate becomes too low to support the desired total revenue, explain how the seat turnover needs to be changed.
6. Define the term sales mix and explain what influence sales mix can have on an average check.
7. What factors would a restaurant manager need to consider when establishing individual menu item prices?
8. Explain why you do or do not think that the food cost percentage figure is important in menu pricing.
9. In menu engineering, what are the two main factors about each menu item that are considered?
10. In menu engineering, state what dogs are.
11. Why is loss of sales revenue from hotel rooms not occupied on a given day more of a problem than loss of sales revenue from customers who did not show up in a restaurant on a given day?
12. Explain briefly how a motel's average room rate can be calculated or projected by using the bottom-up approach.
13. If a hotel has an average room rate of $75, explain why every customer staying in the hotel will not pay this average rate.
14. Describe how a double-occupancy percentage for rooms is calculated.
15. Of what value might it be to calculate hotel room occupancy by day of the week, or seat turnover in a restaurant by day of the week, rather than using an average weekly figure?
16. Define the terms rack rate and potential average room rate.
17. Define elasticity of demand and, using figures of your own choosing, show how a reduction in a hotel's average room rate and the resulting change in total sales revenue would indicate an inelastic demand situation.
18. State the equation for calculating elasticity of demand.
19. What implications does the breakdown of a business's costs into fixed and variable ones have on the pricing decision?
20. Discuss the concept of product and/or service differentiation in a restaurant situation.

ETHICS SITUATION

A hotel manager has set a rack rate for all rooms in the hotel of $149 for next year. Corporations, conventions, and conference groups were advised that early next year the rack rate charged could be reduced to a lower rate of $99, and the potential reduction will depend on the volume of business they provide. Travel

agencies, which book a good number of hotel reservations for independent travelers, were advised that room rate discounts are available for $139, $129, and $119, with restrictions. The travel agencies were also advised that rooms booked at the $149 rate would increase their commission to 15 percent rather than the normal 10 percent for a discounted rate reservation. Individuals that telephone the hotel directly for a reservation are first quoted the $149 rate; however, employees booking reservations have been trained to lower this rate to $139, $129, and $119, but never lower than $119. In addition, room-booking employees are required to advise potential guests of the restrictions that apply at each rate level. Discuss the ethics of this situation.

EXERCISES

E6.1 Determine the operating income necessary to yield a net after-tax income of $28,000 using a current tax rate of 20 percent.

E6.2 Using information given in E6.1, identify the amount of income tax to be paid.

E6.3 If the total fixed and other identified operating costs are estimated to be $145,000 and all variable costs total 84 percent of total sales revenue, what is estimated total sales revenue?

E6.4 Average revenue of a restaurant with 88 seats for a month with 26 operating days and a seat turnover of 2.5 is $46,800. Determine the average check for the month.

E6.5 Using information from E6.4, determine the effect on the average check if seat turnover decreases from 2.5 to 2 times per day.

E6.6 A restaurant with 108 seats, serving both lunch and dinner 6 days per week, reported total annual sales revenue of $988,000. Dinner generates 65 percent of total sales revenue, with a seat turnover of 1.75. What is the average check for dinner?

E6.7 A rooms operation reported a total of 8,760 rooms sold, with a total of 10,512 guests in the previous year. What was the double-occupancy rate?

E6.8 A small motel operation with 40 rooms has an average occupancy rate of 70 percent. The forecasted sales revenue for the coming year is $776,720. What is the average room rate expected to be?

E6.9 Assume a rooms operation had 40 each, 240-square-foot rooms, and 20 each, 180-square-foot rooms. The average occupancy for both types of rooms is 74 percent. An average of $2,220 of sales revenue is required per day. Determine the rate to charge for each square foot.

E6.10 Using the following information, determine the average single- and double-room rates:

Average rooms sold per day: 40
Average rooms double occupied: 15
Spread wanted between single- and double-room rate: $8.00
Average daily revenue: $1,880

PROBLEMS

P6.1 You have the following projections about the costs in a family restaurant for next year:

Net income required:	15% after income tax on the owner's present investment of $80,000, income tax rate is 25%.
Depreciation:	Present book value (consolidated) of furniture and equipment is $75,500, depreciation rate is 20%.
Interest:	Interest on a loan outstanding of $35,000 is 8%.

Known Costs		*Variable Costs*
Insurance	$ 3,000	Food cost, 36% of sales revenue
License	2,500	Wage cost, 34% of sales revenue
Utilities	8,400	Other costs, 12% of sales revenue
Maintenance	3,600	
Administration	9,800	
Salaries	32,400	

a. What sales revenue would the restaurant have to achieve next year in order to acquire the desired net income after tax?

b. What is the required average check needed to achieve the annual revenue objective if the restaurant is open 365 days, had 60 seats, and had an average seat turnover of 2.5 times per day?

P6.2 A 25-room budget motel expects its occupancy next year to be 80 percent. The owners' investment is $401,600. They want an after-tax return on their investment of 10 percent. Tax rate is 28 percent.

- Interest on a long-term mortgage is 10 percent. Present balance outstanding is $806,400.
- Depreciation rate on the building is 10 percent of the present book value of $700,200. Depreciation on the furnishings and equipment is at 20 percent of the consolidated present book value of $150,400.
- Other known fixed costs total $141,800 a year.
- At 80% occupancy rate, the motel's operating expenses, wages, supplies, laundry, etc. are calculated to be $55,400 a year.

- The motel has other income from vending machines of $5,200 a year.

a. To cover all costs and produce the required net income after tax, what should the motel's average room rate be next year?

b. If the motel operates at 30 percent double occupancy and has an $8.00 spread between its single and double rates, what will the single- and double-room rates be? Assume only one common room size, all with the same rates.

P6.3 A restaurant has 90 seats. Total annual sales revenue for next year is projected to be $975,000. The restaurant is open 52 weeks a year and serves breakfast and lunch 6 days a week. Dinner is served 7 days a week. Seat turnover per day is anticipated to be 2.0 times for breakfast, 1.5 times for lunch, and 1.25 times for dinner. Sales revenue is derived at 20 percent from breakfast, 30 percent from lunch, and 50 percent from dinner. Calculate the restaurant's average check by meal period.

P6.4 A 140-seat dining room had a weekly customer count by meal period and day:

	Lunch	***Dinner***
Sunday	Closed	180
Monday	160	110
Tuesday	170	112
Wednesday	175	108
Thursday	160	120
Friday	180	210
Saturday	50	250

a. For each meal period and for each day of the week calculate the seat turnover.

b. Calculate the average number of customers per day and the average seat turnover for the week for each meal period.

c. List some of the ways in which the information in parts a and b would be useful to the restaurant manager or owner.

P6.5 You have the following information about Beech Tree Café's lunch menu with 10 entrées:

Menu Item	***Number Sold (MM)***	***Menu Item Food Cost***	***Menu Item Selling Price***
1. Corn beef on rye	328	$1.35	$5.95
2. Salmon salad sandwich	288	1.18	5.50
3. Club sandwich	420	1.36	5.95
4. Egg and tomato sandwich	192	0.76	4.95

Menu Item	*Number Sold (MM)*	*Menu Item Food Cost*	*Menu Item Selling Price*
5. Roast beef and lettuce sandwich	164	1.05	6.95
6. Chicken wings	236	2.21	8.95
7. Hot dog and fries	152	0.84	4.50
8. Hamburger and fries	536	0.97	6.50
9. Cheeseburger and fries	312	1.12	6.95
10. Veggie burger and salad	185	1.85	6.95

Complete a menu engineering worksheet using the information given above. Exhibits 6.4 and 6.5 can be used as a guide. Discuss how you would adjust the menu.

P6.6 An owner invested $180,000 in a new family-style restaurant, of which $160,000 was immediately used to purchase equipment and $20,000 was retained for working cash. Estimates for the first year of business are as follows:

- Menu selling prices to be established to give a markup of 150 percent over cost of food sold
- Variable wages, 28 percent of revenue
- Fixed wages, $51,600
- Other variable costs, 7 percent of revenue
- Rent, $36,000
- Insurance, $4,800
- Depreciation on equipment, 20 percent
- Return on investment desired, 12 percent
- Income tax rate, 30 percent

The restaurant has 60 seats and is open 5 days a week for lunch and dinner only. Lunch revenue is expected to be 40 percent of total volume with 2 seat turnovers. Dinner revenue will be 60 percent of total volume, with 1.25 turnovers.

Calculate the average check per meal period that will cover all costs, including desired return on investment.

P6.7 You have been given the following information on the next page about a hotel for the next year. The hotel has 40 rooms and expected occupancy rate of 70 percent. Rooms department, operating expenses, wages, supplies, laundry, and so on is 27 percent of room's sales revenue.

a. Calculate the hotel's average room rate for next year.

b. If the hotel did operate at 30 percent double occupancy and management wanted a $15 spread between the single- and double-room rates, what would these rates be?

Administrative and general	$ 38,300
Marketing	28,900
Energy costs	35,100
Repairs and maintenance	28,800
Property taxes	17,600
Insurance	4,800
Telephone department operating loss	(9,700)
Contributory income, food and beverage departments	103,200
First mortgage, at 8% interest, present balance	601,000
Second mortgage, at 12% interest, present balance	402,000
Ownership equity (after-tax return of 15% is expected)	280,000
Book value of fixed assets before depreciation charges:	
Land	250,000
Building	1,860,000
Furniture and equipment (combined)	382,000
Depreciation rate on building	5%
Depreciation rate on furniture and equipment (combined)	20%
Income tax rate	25%

P6.8 A motel has 30 rooms and expects a 70 percent occupancy next year. The owners' investment is presently $520,000, and they expect a 12 percent after-tax annual return on their investment. The motel is in a 24 percent tax bracket. The motel is carrying two mortgages: the first mortgage in the amount of $359,000 at a 10 percent interest rate and the second mortgage in the amount of $140,000 at a 14 percent interest rate. Present book value of building is $632,000, and depreciation rate is 5 percent. Present combined book value of furniture and equipment is $117,000, and the combined depreciation rate is 20 percent. Indirect costs are $44,800 and direct costs are $59,300. The motel also receives an additional $12,000 a year leasing out its restaurant.

a. Calculate the motel's required average room rate to cover all expenses and provide the owners with their desired return on investment.

b. Calculate the average single and double rates, assuming a 60 percent double occupancy and a $12 difference between singles and doubles.

P6.9 A 45-room resort hotel has three sizes of rooms, as follows:

- 15 singles at 150 square feet each
- 15 doubles at 220 square feet each
- 15 suites at 380 square feet each

Occupancy is 80 percent. Demand for each type of room is about equal. The projected total sales revenue from rooms next year is

$912,500. If average room rate were to be based solely on room size, what would the average room rate for each type of room be next year?

P6.10 The Resolute Resort hotel currently operates at a 75 percent occupancy, using a rack rate for all rooms of $60 and a marginal cost per room sold of $8. Calculate the occupancy figures for discount grid using discount percentages of 5, 10, 15, and 20 percent.

P6.11 Motley Motel's potential average room rate is calculated to be $62. Assume that this motel had three market segments. Vacation travelers use 75 percent of the room nights and are charged 100 percent of the rack rate. Business travelers use 15 percent of the room nights and are charged 90 percent of the rack rate. Sports teams account for 10 percent of the room nights and are charged 80 percent of the rack rate.

a. Calculate the room rate by market segment.

b. Prove that your calculations are correct, assuming that total annual room nights are 7,300.

P6.12 The Inviting Inn has 500 available guest rooms. For a certain week next month, the anticipated transient demand for rooms is as follows:

Monday	200
Tuesday	200
Wednesday	200
Thursday	200
Friday	100
Saturday	50
Sunday	50

The Inn also has committed the following number of rooms for group sales during the same week:

Monday	200
Tuesday	200
Wednesday	300
Thursday	300
Friday	100
Saturday	100
Sunday	100

The Inn has the possibility of booking another group of 100 rooms for the nights of Tuesday, Wednesday, Thursday, and Friday of that week at a discounted rate of $60 per room. The Inn's rack rate for transient guests is $80, and its marginal cost per room sold is $15.

a. Assuming the new group is booked, calculate the additional net sales revenue (gross sales revenue less marginal costs) to the Inn.

b. What factors, other than net sales revenue, might you consider before committing to this new group sale?

CASE 6

In the case at the end of Chapter 3, you calculated the average food and beverage check for the 4C Company's 84-seat restaurant in Year 2004. The restaurant was open for 52 weeks, 6 days a week for lunch, and 5 days a week for dinner. An analysis of sales checks indicated that the average turnover was 1.5 times for lunch and 1.25 times for dinner. Lunch contributes about 45 percent of total sales revenue and dinner, 55 percent. Total beverage sales revenue is 20 percent at lunch and 80 percent at dinner.

a. Calculate the average lunch and average dinner checks for food and beverages. This information will be used in a later case.

b. Suggest to Charlie a number of ways in which he could attempt to raise the average check and the total food and beverage sales revenue for Year 2005.

c. In part b, one of the ways might be to substitute, on the food menu, items with a low selling price for items with a high selling price. Write a short report to Charlie about the effect this might have on the restaurant's guests, its food cost percentage, and its gross margin and net income.