CHAPTER 7

COST MANAGEMENT

INTRODUCTION

This chapter introduces and describes various costs that exist in a business operation, including direct costs, indirect costs, controllable and noncontrollable costs, joint costs, discretionary costs, relevant and nonrelevant costs, sunk costs, opportunity costs, fixed costs, variable costs, semifixed or semivariable costs, and standard costs.

The chapter continues by showing how to allocate indirect costs to departments and the potential difficulties this may create are discussed.

Using relevant costs to assist in determining which piece of equipment to buy is illustrated.

Fixed and variable costs are discussed in relation to their use in the management decision process; that is, whether to accept or reject an offered price for services to be rendered. The evaluation of fixed and variable costs is illustrated in three additional problems: to close or not close during an off-season period; deciding which business to buy; and deciding whether to accept a fixed or variable lease on a facility.

Having illustrated how important understanding fixed and variable cost relationships as in the decision process, the chapter concludes with an illustration of how semifixed or semivariable costs can be separated into their fixed and variable elements.

CHAPTER OBJECTIVES

After studying this chapter, the reader should be able to

1. Briefly define and give examples of some of the major types of costs, such as direct and indirect costs, fixed and variable costs, and discretionary costs.
2. Prorate indirect costs to revenue departments and make decisions based on the results.

3. Use relevant costs to help determine which piece of equipment to buy.
4. Use knowledge about fixed and variable costs for a variety of different business decisions, such as whether to close during the off-season.
5. Define the term *high operating leverage* and explain its advantages and disadvantages.
6. Explain and use each of the following three methods to separate semifixed or semivariable costs into their fixed and variable elements: high–low calculation, multipoint graph, and regression analysis.

COST MANAGEMENT

Most of the sales revenue in a hotel or food service enterprise is consumed by costs: as much as 90 cents or more of each revenue dollar may be used to pay for costs. Therefore, cost management is important. Budgeting costs and cost analysis is one way to control and manage costs to improve net income. Another way to improve net income is to cut costs, without regard to the consequences. The latter course of action may not be wise. Perhaps a better way is to look at each cost (expense) and see how it contributes toward net income. If advertising cost leads to higher net income than would be the case if we did not advertise, then it would not pay to cut the advertising expense.

One of the ways to better manage costs is to understand that there are many types of costs. If one can recognize the type of cost that is being considered, then better decisions can be made. Some of the most common types of cost are defined in the following sections.

TYPES OF COST

DIRECT COST

A **direct cost** is one that is traceable to and the responsibility of a particular operating department or division. Most direct costs are variable by nature and will increase or decrease in relation to increases and decreases in sales revenue. For this reason, direct costs are considered to be controllable by, and the responsibility of the department or division manager to which they are charged. Examples of these types of costs are cost of sales–food and –beverages, wages and salaries, operating supplies and services, and linen and laundry.

INDIRECT COST

An **indirect cost** is one that cannot be identified with and traceable to a particular operating department or division, and thus, cannot be charged to any specific department or division. General building maintenance could only be charged to various departments or divisions (such as rooms, food, or beverage) with difficulty. Even if this difficulty could be overcome, it must still be recognized that indirect costs cannot normally be considered the responsibility of operating departments' or divisions' managers. Indirect costs are frequently referred to as **undistributed costs.**

CONTROLLABLE AND NONCONTROLLABLE COSTS

If a cost is controllable, the manager can influence the amount spent. For example, the kitchen manager can influence the amount spent on food. However, it is unlikely the kitchen manager can influence the amount spent on rent, especially in the short term. The mistake is often made of calling direct costs **controllable costs** and indirect costs **noncontrollable costs.** It is true that direct costs are generally more easily controlled than indirect costs, but in the long run all costs are controllable by someone at some time.

JOINT COST

A **joint cost** is one that is shared by, and thus is the responsibility of, two or more departments or areas. A dining room server who serves both food and beverage is an example. The server's wages are a joint cost and should be charged (in proportion to revenue, or by some other appropriate method) partly to the food department and the remainder to the beverage department. Most indirect costs are also joint costs. The problem is to find a rational basis for separating the cost and charging part of it to each department.

DISCRETIONARY COST

This is a cost that may or may not be incurred based on the decision of a particular person, usually the general manager. Nonemergency maintenance is an example of a **discretionary cost.** The building exterior could be painted this year, or the painting could be postponed until next year. Either way sales revenue should not be affected. The general manager has the choice, thus it is a discretionary cost. Note that a discretionary cost is only discretionary in the short run. For example, the building will have to be painted at some time in order to maintain its appearance.

RELEVANT AND NONRELEVANT COSTS

A **relevant cost** is one that affects a decision. To be relevant, a cost must be in the future and different between alternatives. For example, a restaurant is considering replacing its mechanical sales register with an electronic one. The relevant costs would be the cost of the new register (less any trade-in of the old one), the cost of training employees on the new equipment, and any change in maintenance and material supply costs on the new machine. As long as no change is necessary in the number of servers required, the restaurant's labor cost would not be a relevant cost. It would make no difference to the decision.

SUNK COST

A **sunk cost** is a cost already incurred and about which nothing can be done. It cannot affect any future decisions. For example, if the same restaurant had spent $250 for an employee to study the relative merits of using mechanical or electronic registers, the $250 is a sunk cost. It cannot make any difference to the decision.

OPPORTUNITY COST

An **opportunity cost** is the cost of not doing something. An organization can invest its surplus cash in marketable securities at 10 percent, or leave the money in the bank at 6 percent. If it buys marketable securities, its opportunity cost is 6 percent. Another way to look at it is to say that it is making 10 percent on the investment, less the opportunity cost of 6 percent; therefore, the net gain is a 4 percent interest rate.

FIXED COST

Fixed costs are not expected to change in the short run of an operating period of a year or less, and will not vary with increases or decreases in sales revenue. Examples are management salaries, fire insurance expense, rent paid on a square-foot basis, or the committed cost of an advertising campaign. Over the long run fixed costs can, of course, change, but in the short run they are not expected to change. If a fixed cost should change over the short run, the change would normally result only from a decision of specific top management.

VARIABLE COST

A **variable cost** is one that changes in direct proportion to a change in sales revenue. Very few costs are strictly linear, but two that are (with only a slight possibility that they will not always fit this strict definition) are the cost of sales of food and beverages. The more food and beverages sold, the more costs will be incurred. If sales are zero, no food or beverage costs are incurred.

SEMIFIXED OR SEMIVARIABLE COSTS

Most costs do not fit neatly into the fixed or the variable category. Most have an element of fixed cost and an element of variable cost. As well, they are not always variable directly to sales on a straight-line basis. Such costs would include payroll, maintenance, utilities, and most of the direct operating costs. In order to make some useful decisions, it is advantageous to break down these **semifixed** or **semivariable** costs into their two elements: fixed or variable. Ways of doing this will be discussed later in this chapter.

STANDARD COST

A **standard cost** is what the cost should be for a given volume or level of sales. We saw some uses of such standards in Chapter 5. Other uses would be in budgeting (see Chapter 8), in pricing decisions (Chapter 6), and in expansion planning (Chapter 12). Standard costs need to be developed by each establishment since there are many factors that influence standard costs and that differ from one establishment to another.

Let us look at some of the ways in which an analysis of the type(s) of cost(s) with which we are dealing would help us make a better decision.

ALLOCATING INDIRECT COSTS TO REVENUE AREAS

One of the difficulties in allocating indirect costs is determining the correct basis to be used to apportion indirect costs to each sales revenue department or division. Some of the methods that could be used were discussed in Chapter 2. If the allocation of indirect costs is made using an incorrect basis, then incorrect decisions could be made. If the correct allocation basis were used, then presumably the incorrect decisions would not be made.

Consider the following restaurant complex that has two main sales revenue outlets, a dining room and a snack bar. Sales revenue and direct costs for each sales area and indirect costs that have not been distributed are shown below for a typical month; an average monthly operating income for the total operation is stated at $12,000.

	Dining Room	*Snack Bar*	*Total*
Sales revenue	$105,000	$45,000	$150,000
Direct costs	(75,000)	(39,000)	(114,000)
Contributory income	$ 30,000	$ 6,000	$ 36,000
Indirect costs			(24,000)
Operating income			$ 12,000

Management believes the $24,000 of total indirect costs should be allocated to the two operating departments using sales revenue as the basis to allocate the indirect costs. Summing total sales revenue and dividing each operating department's sales revenue by total sales revenue determines the allocation percentages. In other words, the dining room provides 70 percent ($105,000 / $150,000) of sales revenue and the snack bar provides 30 percent ($45,000 / $150,000) of sales revenue. The new monthly statement of operating income is:

	Dining Room	*Snack Bar*	*Total*
Sales revenue	$105,000	$45,000	$150,000
Direct costs	(75,000)	(39,000)	(114,000)
Contributory income	$ 30,000	$ 6,000	$ 36,000
Indirect costs	(16,800)	(7,200)	(24,000)
Operating income	$ 13,200	($ 1,200)	$ 12,000

This shows that, by distributing indirect costs on a basis of sales revenue, the snack bar is losing $1,200 a month. Management of the restaurant complex has an opportunity to lease out the snack bar, as is, for $750 a month rent. The new operator will pay for the indirect costs of the snack bar (such as administration, advertising, utilities, maintenance); the indirect costs were evaluated to be $19,350, all of which must be assumed by the dining room. This seems to be a good offer. A $750 profit appears better than an $1,200 loss. The following is the new dining room monthly statement of operating income:

Sales revenue	$105,000
Direct costs	(75,000)
Contributory income	$ 30,000
Indirect costs	(19,350)
Income before rent	$ 10,650
Rent income	750
Operating income	$ 11,400

These figures indicate that the dining room's operating income, including rent is only $11,400. Earlier it was calculated to have been $13,200 without any rent income. Overall, operating income has decreased. Obviously, the mistake was made in allocating indirect costs to the dining room and the snack bar on the basis of sales revenue and then making a decision based on this allocation. A more careful assessment of indirect costs should have been made, with allocation made on a more logical basis. If this had been done (with the information we now have about the dining room's indirect costs), the real situation would have been as follows, which shows that both sales departments were, in fact, making an operating income:

	Dining Room	*Snack Bar*	*Total*
Sales revenue	$105,000	$45,000	$150,000
Direct costs	(75,000)	(39,000)	(114,000)
Contributory income	$ 30,000	$ 6,000	$ 36,000
Indirect costs	(19,350)	(4,650)	(24,000)
Operating income	$ 10,650	$ 1,350	$ 12,000

This shows that renting out the snack bar that currently provides operating income of $1,350 a month for $750 a month would reduce operating income by $600. To look at it another way, the $750 rental income is the opportunity cost of not renting out the snack bar, but since it is less than the $1,350 now being made, it can be ignored.

WHICH PIECE OF EQUIPMENT SHOULD WE BUY?

One of the ongoing decisions all managers face is that of choosing between alternatives. Which items do we offer on a menu, which employee should we hire, how should we spend the advertising budget? One area of decision making where the knowledge of costs is helpful is that of selecting a piece of equipment. The following might be a typical situation.

A motel owner has asked his accountant to research the photocopier equipment available from vendors, and to recommend the two best equipment alternatives. The motel owner will decide which item of equipment to purchase. The fee charged for the accountant's research was $500. The accountant's report produced the following information:

	Equipment A	*Equipment B*
Initial cost, including installation	$10,000	$ 8,000
Economic life	10 years	10 years
Scrap value at end of economic life	-0-	-0-
Initial training cost	$ 500	$ 1,000
Annual maintenance	$ 400	$ 300
Annual cost of forms	$ 750	$ 850
Annual wage cost	$22,500	$22,500

The $500 fee is a sunk cost and will be paid regardless of the decision—even if a decision is made not to buy either piece of equipment.

To make a decision, the motel owner must sort out the relevant information, which is as follows for year 1:

	Equipment A	*Equipment B*
Initial cost	$10,000	$ 8,000
Initial training cost	500	1,000
Operating costs		
Maintenance (for 10 years)	4,000	3,000
Cost of forms (for 10 years)	7,500	8,500
Total	$22,000	$20,500

In this example, the initial cost of the equipment is relevant. Staff wage cost is irrelevant, since it is the same in both cases.

The total 10-year cost is less for Equipment B. Certain assumptions have been made: that one can forecast costs for 10 years and that the costs as originally estimated are accurate. In the final decision, costs might not be the only factor to be considered. A more comprehensive look at the investment decision situation will be taken in Chapter 12.

CAN WE SELL BELOW TOTAL COST?

The obvious answer to a question of selling below cost is dependent on whether the person responding to the question understands the nature of fixed and variable costs. In general, the answer would be, "Not unless you plan to go broke." However, before the question can be answered intelligently, we should first answer which cost. The best answer would be: "If variable costs are covered and a contribution toward fixed costs is made, selling below total cost can be considered."

Consider a catering company that rents its facilities for $80,000 per year and has additional annual fixed costs for management salaries, insurance, depreciation charges on furnishings and equipment, and other fixed costs of $66,000. The total fixed costs would be $146,000, or an average of $400 per day:

Fixed costs / 365 days = $146,000 / 365 = $400

The catering company and its facilities can handle only one function per day, and operates with a variable cost of 60 percent of total sales revenue. The company was approached by an organization wanting to sponsor a lunch for 60 people next week but can only pay $10.00 per person. Normally, this catering company would not consider handling a group luncheon this small; however, on this occasion the catering company does not see any likelihood of booking a

function in the next few days. If the catering company accepts this function, its income situation will be as follows:

Revenue (60 people × $10.00 each)	**$600.00**
Less: Variable costs (60% × $600)	**(360.00)**
Contribution margin	**$240.00**
Less: Fixed costs	**(400.00)**
Operating loss	**($160.00)**

On the surface, the net loss appears unfavorable; however, considering we incur the $400 fixed cost whether we accept the function or not, we see a different perspective of accepting the function. By selling below total cost of $760 ($360 + $400), we offset $240 of the $400 of fixed costs that would be incurred with or without the function. In the short run, as long as sales revenue exceeds variable costs and contributes toward fixed costs, it is beneficial to accept the business.

SHOULD WE CLOSE DURING THE OFF SEASON?

The same reasoning as in the previous case can be applied to a seasonal operation in answering the question of staying open or closing during the off season. Consider the case of a motel that has the income statement shown below:

Sales revenue	$390,000
Expenses	(330,000)
Net Income	$ 60,000

The owner decided to make an analysis of sales revenue and costs by the month and found that for 10 months he was making money and for 2 months he was losing money. Variable costs were 20 percent of sales revenue; total fixed costs were $252,000, or $21,000 a month. The following summarizes his findings:

	10 months	*2 months*	*Total*
Sales revenue	$375,000	$15,000	$390,000
Variable costs	$ 75,000	$ 3,000	$ 78,000
Fixed costs	210,000	42,000	252,000
Total costs	$285,000	$45,000	$330,000
Net income	$ 90,000	($30,000)	$ 60,000

The owner's analysis seemed to indicate that he should close to eliminate the $30,000 loss during the 2-month loss period. But if he does, the fixed costs for the 2 months ($42,000) will have to be paid out of the ten months' net income, and $90,000 (10 months net income) less two months fixed costs of $42,000 will reduce his annual net income to $48,000 from its current $60,000. If he does not want a reduction in annual net income, he should not close.

In such a situation, there might be other factors that need to be considered, and that would reinforce the decision to stay open. For example, there could be sizable additional close-down and start-up costs that would have to be included in the calculation of the cost of closing.

Also, would key employees return after being laid off? Is there a large enough pool of skilled labor available and willing to work on a seasonal basis only? Would there be recurring training time (and costs) at the start of each new season? Is there a group of regular guests that might not return if the motel was closed for two months? These are some of the types of questions that would have to be answered before any final decision to close was made.

WHICH BUSINESS SHOULD WE BUY?

Just as a business manager has to make choices between alternatives on a day-to-day basis, so, too, does an entrepreneur going into business or expanding an existing business. Let us look at one such situation.

A restaurant chain is eager to expand. It has an opportunity to take over one of two similar existing restaurants. The two restaurants are close to each other, they have the same type of clientele and size of operation, and the asking price is the same for each. They are also similar in that each is taking in $1,000,000 in sales revenue a year, and each has a net income of $100,000 a year. With only this information it is difficult to make a decision as to which would be the more profitable investment. But a cost analysis as shown in Exhibit 7.1 reveals differences.

	Restaurant A		*Restaurant B*	
Sales revenue	$1,000,000	100.0%	$1,000,000	100.0%
Variable costs	$ 500,000	50.0%	$ 300,000	30.0%
Fixed costs	400,000	40.0%	600,000	60.0%
Total costs	$ 900,000	90.0%	$ 900,000	90.0%
Net Income	$ 100,000	10.0%	$ 100,000	10.0%

EXHIBIT 7.1

Statements Showing Differences in Cost Structure

	Restaurant A		*Restaurant B*	
Sales revenue	$1,100,000	100.0%	$1,100,000	100.0%
Variable costs	$ 550,000	50.0%	$ 330,000	30.0%
Fixed costs	400,000	36.4%	600,000	54.5%
Total costs	$ 950,000	86.4%	$ 930,000	84.5%
Net Income	$ 150,000	13.6%	$ 170,000	15.5%

EXHIBIT 7.2

Effect of Increased Sales Revenue on Costs and Net Income

Although the sales revenue and net income are the same for each restaurant, the structure of their costs is different, and this will affect the decision of which one could be more profitable. The restaurant chain that wishes to take over either A or B is optimistic about the future. It believes that, without any change in fixed costs, it can increase annual sales revenue by 10 percent. What effects will this have on the net income of A and B? Net income will not increase for each restaurant by the same amount. Restaurant A's variable cost is 50 percent. This means that, out of each dollar of additional sales revenue, it will have variable expenses of $0.50 and a net income of $0.50 (fixed costs do not increase). Restaurant B has variable costs of 30 percent, or $0.30 out of each revenue dollar, leaving a net income of $0.70 from each dollar of extra sales revenue (again, fixed costs do not change).

Assuming a 10 percent increase in sales revenue and no new fixed costs, the income statements of the two restaurants have been recalculated in Exhibit 7.2. Note that Restaurant A's net income has gone up by $50,000 (to $150,000), but Restaurant B's has gone up by $70,000 (to $170,000). In this situation, Restaurant B would be the better investment.

A company that has high fixed costs relative to variable costs is said to have **high operating leverage.** From a net income point of view, it will do better in times of rising sales revenue than will a company with **low operating leverage**

	Restaurant A		*Restaurant B*	
Sales revenue	$900,000	100.0%	$900,000	100.0%
Variable costs	$450,000	50.0%	$270,000	30.0%
Fixed costs	400,000	44.4%	600,000	66.7%
Total costs	$850,000	94.4%	$870,000	96.7%
Net Income	$ 50,000	5.6%	$ 30,000	3.3%

EXHIBIT 7.3

Effect of Decreased Sales Revenue on Costs and Net Income

	Restaurant A		*Restaurant B*	
Sales revenue	$800,000	100.0%	$857,143	100.0%
Variable costs	$400,000	50.0%	$257,143	30.0%
Fixed costs	400,000	50.0%	600,000	70.0%
Total costs	$800,000	100.0%	$857,143	100.0%
Normal Income	-0-	-0-	-0-	-0-

EXHIBIT 7.4

Breakeven Sales Revenue Level Depends on Cost Structure

(low fixed costs relative to variable costs). A company with low fixed costs will be better off when sales revenue starts to decline. Exhibit 7.3 illustrates this, under the assumptions that our two restaurants are going to have a decline in sales revenue of 10 percent from the present $1,000,000 level and that there will be no change in fixed costs. Exhibit 7.3 shows that, with declining sales revenue, Restaurant A's net income will be higher than Restaurant B's.

In fact, if sales revenue declines far enough, Restaurant B will be in financial difficulty long before Restaurant A. If the breakeven point were calculated (the breakeven point is that level of sales revenue at which there will be neither net income nor loss), Restaurant A's sales revenue could go down to $800,000, while Restaurant B would be in difficulty at $857,143. This is illustrated in Exhibit 7.4.

One could determine the breakeven level of sales revenue by trial and error, but there is a formula for quickly calculating this level. The formula, and a more in-depth discussion of fixed and variable costs and how an awareness of this structure can be of great value in many types of business decisions, is called cost–volume–profit (CVP) analysis and is covered in Chapter 8.

PAYING A FIXED OR A VARIABLE LEASE

Another situation where fixed and variable cost knowledge can be very useful is in comparing the alternative of a fixed cost lease versus a variable cost lease, based on a percentage of sales. For example, consider the case of a restaurant that has an opportunity to pay a fixed rent for its premises of $5,000 a month ($60,000 a year) or a variable rent of 6 percent of its revenue. Before making the decision, the restaurant's management needs to first determine the breakeven point of sales at which the fixed rental payment for a year would be identical to the variable rent. The equation for this is

Fixed cost lease = Variable cost lease

Or it can be restated as

$$\textbf{Annual breakeven sales revenue} = \frac{\textbf{Fixed lease cost}}{\textbf{Variable lease percentage}}$$

Inserting the figures, we can determine the sales revenue level as follows:

$$\frac{\$60{,}000}{6\%} = \underline{\underline{\$1{,}000{,}000}}$$

In other words, at $1,000,000 of sales it makes no difference whether the restaurant paid a fixed rent of $60,000 or a variable rent of 6 percent of sales. At this level of sales, management would be indifferent and it is often referred to as the *indifference point.*

If management expected revenue to exceed $1,000,000, it would select a fixed-rental arrangement. If sales revenue were expected to be below $1,000,000, it would be better off selecting the percentage-of-sales arrangement.

SEPARATING COSTS INTO FIXED AND VARIABLE ELEMENTS

Once costs have been categorized into fixed or variable elements, valuable information is available for use in decision making. Some costs are easy to identify as definitely fixed or definitely variable. The semifixed or semivariable types of costs must be broken down into the two separate elements.

A number of different methods are available for breaking down these semicosts into their fixed and variable components, some more sophisticated (and thus usually more accurate) than others. Three will be discussed:

- High–low method
- Multipoint graph method
- Regression analysis method

To set the stage, we will use the income statement of the Model Motel for a year's period (see Exhibit 7.5). The Model Motel is a no-frills, 70-unit budget operation without food or beverage facilities. It operates at 59.9 percent occupancy and, as a result of good cost controls, is able to keep its average room rate down to $40.00. Last year it sold a total of 15,300 rooms ($612,000 total income divided by $40.00).

The first step is to list the expenses by category (fixed, variable, semivariable). The owner's or manager's past experience about the costs of the Model Motel, or the past year's accounting records, will be helpful in creating this list.

Sales revenue		$612,000
Expenses		
Employee wages	$241,600	
Management salary	40,000	
Laundry, linen, and guest supplies	77,400	
Advertising	15,000	
Maintenance	34,600	
Utilities	36,200	
Office/telephone	8,000	
Insurance	9,200	
Interest	16,600	
Property taxes	40,200	
Depreciation	70,000	
Total expenses		(588,800)
Net income		$ 23,200

EXHIBIT 7.5

Income Statement Without a Cost Breakdown

The figures in the fixed column (see Exhibit 7.6) are those that do not change during the year with a change in sales volume (number of rooms sold). A fixed cost may change from year to year (e.g., insurance rates may change or management may decide to vary the amount spent on insurance), however, such changes are not directly related to, or caused by, the number of guests accommodated. The items in the variable column are the costs that are the direct result of guests using the facilities (if there are no guests or customers, there will

	Fixed	*Variable*	*Semivariable*
Employee wages			$241,600
Management salary	$40,000		
Laundry, linen, and guest supplies		$77,400	
Advertising	15,000		
Maintenance			34,600
Utilities			36,200
Office/telephone			8,000
Insurance	9,200		
Interest	16,600		
Property taxes	40,200		
Depreciation	70,000		

EXHIBIT 7.6

Costs Allocated as Fixed, Variable, and Semivariable

	Units (Rooms) Sold	*Wage Costs*
January (low month)	500	$ 14,400
February	1,000	15,800
March	1,300	19,800
April	1,200	21,600
May	1,400	24,400
June	1,500	24,200
July	2,100	26,200
August (high month)	2,100	26,400
September	1,500	23,600
October	1,000	15,200
November	1,000	14,800
December	700	15,200
Totals	15,300	$241,600

EXHIBIT 7.7

Analysis of Units Sold and Wage Costs by Month

be no cost for laundry, linen, and guest supplies). As occupancy levels increase or decrease, the variable costs will also increase or decrease proportionally. The figures in the semivariable column are those we must separate into their fixed and variable components.

To demonstrate the three methods of breaking down a semivariable cost, we will use the wages cost of $241,600. Since much of the wage cost is related to number of rooms sold, we need a month-by-month breakdown of the sales revenue for each month and the related wage cost for each month. This information could be broken down by week, but there should be sufficient accuracy for all practical purposes with a monthly analysis. The sales and labor cost breakdown is given in Exhibit 7.7. Note that the sales column figures are in numbers of units sold. This column could have been expressed in dollars of sales revenue without it affecting our results (as long as the average room rate of $40.00 had been relatively consistent during the year).

HIGH–LOW METHOD

The **high–low method** is also called the maximum-minimum method. It has three steps. With reference to Exhibit 7.7, note that the month of August is identified as the high month, which identifies it as the month with the highest units sold and the highest wage costs. In contrast, January is the low month, and

shows units sold and wage costs were at their lowest for the year. To use this method, the change in costs that has occurred between the high and low months depends on the change in sales volume (the delta symbol **Δ** represents change).

Step 1: Deduct the low figure from the high figure of each unit and cost categories:

	Units (Rooms) Sold	***Wage Costs***
August (high)	2,100	$26,400
January (low)	(500)	(14,400)
Change	**Δ** 1,600	**Δ** $12,000

Step 2: Divide the change in wage costs by the change in units sold:

$$\frac{\Delta \text{ Costs}}{\Delta \text{ Units}} = \frac{\$12{,}000}{1{,}600} = \$7.50 \text{ Variable cost (VC) per unit sold}$$

Step 3: Use the VC per unit answer in Step 2 to calculate the fixed cost element:

Total wage costs for August (high)	$26,400
Variable cost [2,100 units sold × $7.50 a unit] =	(15,750)
Fixed cost	$10,650

Using the same procedures, the low wage costs and low units sold, and the variable cost per unit, the same fixed cost can be found:

Total wage costs for January (low)	$14,400
Variable cost [500 units sold × $7.50 a unit] =	(3,750)
Fixed cost	$10,650

Instead of using units and wage costs to determine variable costs of units sold, sales revenue could be used equally as well to separate wages costs into its fixed and variable elements. This method determines the variable cost per dollar of sales revenue:

Step 1: Deduct the low figure from the high figure of each revenue and cost catagories:

	Units Sold		*Average Rate*		*Total Sales Revenue*	*Wage Costs*
August (high)	2,100	×	$40.00	=	$84,000	$26,400
January (low)	500	×	40.00	=	(20,000)	(14,400)
Change					**Δ** $64,000	**Δ** $12,000

Step 2: Use the change in sales revenue and wage costs from Step 1 to find the variable cost per dollar of sales revenue:

$$\frac{\textbf{Δ}\ \text{Costs}}{\textbf{Δ}\ \text{Sales}} = \frac{\$12{,}000}{\$64{,}000} = \$0.1875 \text{ per dollar of sales revenue}$$

Step 3: Use the VC per dollar of sales answer from Step 2 to calculate the fixed cost element:

Total wage costs for August (high)	$26,400
Variable cost [$84,000 sales revenue × $0.1875] =	(15,750)
Fixed cost	$10,650

As was the case with using low units, we can use the low wage costs, low sales revenue, and variable cost per dollar of sales revenue and the same fixed costs can be found:

Total wage costs for January (low)	$14,400
Variable cost [$20,000 sales revenue × $0.1875] =	(3,750)
Fixed cost	$10,650

* [Alternative: VC is also (500 units sold × $7.50) = $3,750]

The calculated fixed cost is $10,650 a month, or 12 × $10,650 = $127,800 a year.

With reference to Exhibit 7.6, we can now separate our total annual wage cost into its fixed and variable elements.

Total annual wages	$241,600
Fixed costs	(127,800)
Variable costs	$113,800

The calculation of the monthly fixed cost figure has been illustrated by arithmetical means. The high–low figures could equally as well have been plotted on a graph, as illustrated in Exhibit 7.8, and the fixed cost read from where the dotted line intersects the vertical axis. If the graph is accurately drawn, the same monthly figure of approximately $10,600 is obtained.

The high–low method is quick and simple. It uses only two sets of figures. Unfortunately, either one or both of these sets of figures may not be typical of the relationship between sales and costs for the year (for example, a one-time bonus may have been paid during one of the months selected). Other, perhaps less dramatic, distortions may be built into the figures.

These distortions can be eliminated, as long as one is aware of them, by adjusting the raw figures. Alternatively, standard costs rather than actual costs could be used for the low and high sales months.

An alternate method to the high–low method that will show any monthly distortions in individual figures is to plot the cost and sales figures for each of the 12 operating months (or any number of months in an operating period) on

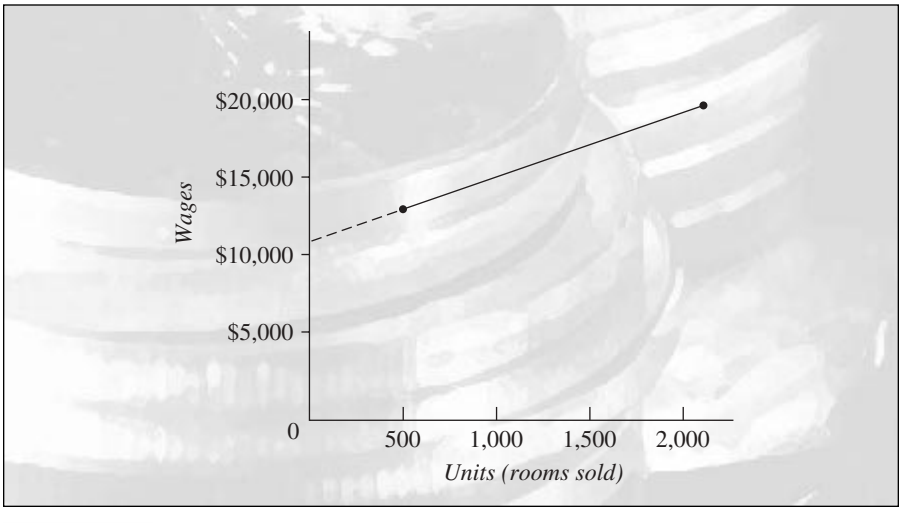

EXHIBIT 7.8

Maximum–Minimum Figure

a graph. As well, the graph will show if the information is linear. If it is not linear, then you cannot use these methods to separate a semivariable cost into its fixed and variable components.

MULTIPOINT GRAPH

Exhibit 7.9 illustrates a **multipoint graph** for our sales in units and our wage cost for each of the 12 months. Sales and costs were taken from Exhibit 7.7. The graph illustrated is for two variables, sales and wages. In this case, wages are given the name **dependent variable** and are plotted on the vertical axis. Wages are dependent on sales because they vary with sales. Sales, therefore, are the **independent variable.** The independent variable is plotted on the horizontal axis. After plotting each of the 12 points, we have what is known as a scatter graph: a series of points scattered around a line that has been drawn through them. A straight line must be drawn.

There is no limit to how many straight lines could be drawn through the points. The line we want is the one that, to our eye, seems to fit best. Each individual doing this exercise would probably view the line in a slightly different position, but most people with a reasonably good eye would come up with a line that, for all practical purposes, is close enough. The line should be drawn

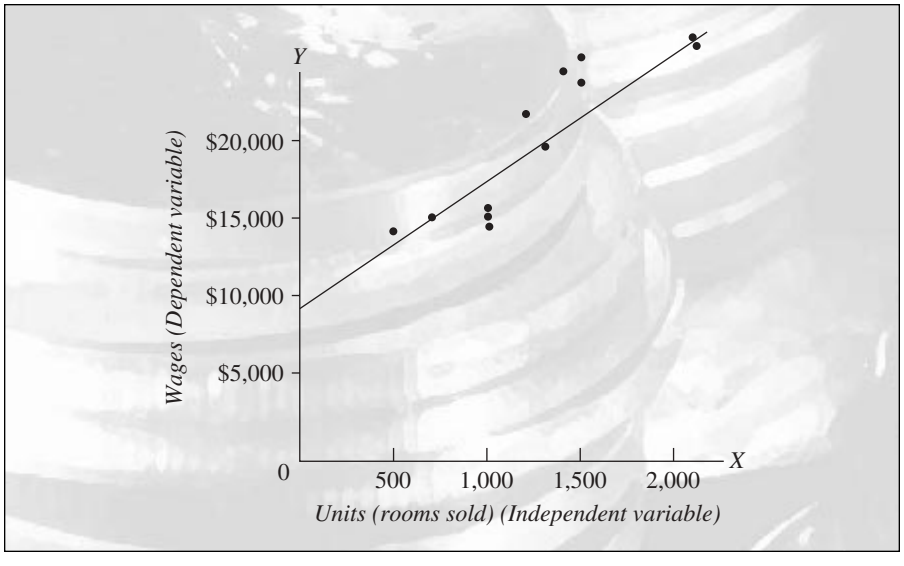

EXHIBIT 7.9
Scatter Graph

so that it is continued to the left until it intersects the vertical axis (the dependent variable). The intersect point reading is our fixed cost (wages, in this case). Note that, in Exhibit 7.9, our fixed cost reading is approximately $9,000. This is the monthly cost. Converted to annual cost, it is $9,000 × 12 = $108,000.

Our total annual wage cost would then be broken down this way:

Fixed wages cost	$108,000
Variable wages cost	$133,600
Total Wages Cost	$241,600

Note that, in drawing graphs for the purpose discussed, the point at which the vertical and horizontal axes intersect should be given a reading of 0. The figures along each axis should then be plotted to scale from the (0, 0) intercept point.

The straight line on a scatter graph can be drawn by eye, and for most purposes will give us a fixed cost reading that is good enough. However, the question arises as to whether there is one best method that provides the most accurate answers related to the graph or the high-low methods. The answer is yes, and the most accurate method is known as regression analysis.

REGRESSION ANALYSIS

With regression analysis there is no need to draw a graph, plot points, and draw a line through them. The objective in drawing the line is to find out where the line intersects the vertical axis so we can read, at that intersection point, what the fixed costs are. Once we know the fixed costs, we can then easily calculate the variable costs (total costs − fixed costs = variable costs). In **regression analysis,** a number of equations have been developed for different purposes. One of the equations allows us to calculate the fixed costs directly, without a graph.

Before the equation is used, we have to take the units (rooms) sold and the wage cost information from Exhibit 7.7 and develop it a little further, as has been done in Exhibit 7.10. In Exhibit 7.10 the units (rooms) sold column has been given the symbol X (X is for the independent variable). The wage cost column (the dependent variable) has been given the symbol Y. Two new columns have been added: XY (which is X multiplied by Y) and X^2 (which is X multiplied by X). The equation is:

$$\textbf{Fixed costs} = \frac{(\Sigma Y)(\Sigma X^2) - (\Sigma X)(\Sigma XY)}{n(\Sigma X^2) - (\Sigma X)^2}$$

Month	Units (Rooms) Sold X	Wage Costs Y	XY (X × Y)	X^2 (X × X)
January	500	$14,400	$ 7,200,000	250,000
February	1,000	15,800	15,800,000	1,000,000
March	1,300	19,800	25,740,000	1,690,000
April	1,200	21,600	25,920,000	1,440,000
May	1,400	24,400	34,160,000	1,960,000
June	1,500	24,200	36,300,000	2,250,000
July	2,100	26,200	55,020,000	4,410,000
August	2,100	26,400	55,440,000	4,410,000
September	1,500	23,600	35,400,000	2,250,000
October	1,000	15,200	15,200,000	1,000,000
November	1,000	14,800	14,800,000	1,000,000
December	700	15,200	10,640,000	490,000
Totals	15,300	241,600	$331,620,000	22,150,000

EXHIBIT 7.10

Illustration of Calculation of Regression Analysis Data

Two new symbols have been introduced in this equation: $\sum$ means the sum of, or the column total figure, and n is the number of periods, in our case 12 (months).

Replacing the symbols in the above equation by the column totals from Exhibit 7.10, we have:

$$\text{Fixed costs} = \frac{\$241{,}600(22{,}150{,}000) - (15{,}300)(331{,}620{,}000)}{12(22{,}150{,}000) - (15{,}300)(15{,}300)}$$

$$= \frac{\$5{,}351{,}440{,}000{,}000 - \$5{,}073{,}786{,}000{,}000}{265{,}800{,}000 - 234{,}090{,}000}$$

$$= \frac{\$277{,}654{,}000{,}000}{31{,}710{,}000}$$

$$= \underline{\$8{,}756.04} \text{ a month}$$

Our answer could be rounded to $8,800 a month, which gives us a total annual fixed cost of

$$\$8{,}800 \times 12 = \underline{\$105{,}600}$$

COMPARISON OF RESULTS

Let us compare the results of our fixed/variable breakdown of the Model Motel's annual wage cost using each of the three methods described. The results are tabulated as follows:

	Fixed	*Variable*	*Total*
High–low method	$127,800	$113,800	$241,600
Multipoint graph method	108,000	133,600	241,600
Regression analysis method	105,600	136,000	241,600

In practice, only one of the three methods would be used. We know that regression analysis is the most accurate; however, because it requires time to perform the necessary arithmetic, it should probably only be used by those who are mathematically adept, or as a spot-check on the results of either of the other two methods. Alternatively, the figures can be fed into a programmed calculator or using spreadsheet software that will carry out all the necessary calculations.

Multipoint graph results are fairly close to the regression analysis figures, which seems to imply that, if the graph is well drawn, we should have results accurate enough for all practical purposes. The high–low method results are about 17.3 percent different from what regression analysis tells us the most correct result should be. Therefore, the high–low method should be used with caution and only if the two periods selected are typical of all periods, which might be difficult to determine.

Once a method has been selected, it should be applied consistently to all semivariable expenses. With reference to our Model Motel's cost figures in Exhibit 7.6, so far we have analyzed the semivariable wage cost. We need to analyze similarly the three other semivariable costs: maintenance, utilities, and office/telephone. Let us assume we have done so using regression analysis; our completed cost analysis gives us the fixed and variable costs shown in Exhibit 7.11.

ALTERNATIVE METHOD

As an alternative to separating semivariable costs by individual expense, the situation can be simplified by first adding together all semivariable costs, then applying one of the three methods outlined in this section to separate only the total into its fixed and variable elements. This considerably reduces the time and effort involved. On the other hand, it might reduce the accuracy of the results. In many cases, however, this reduced accuracy might still be satisfactory for making decisions.

In Chapter 8, we shall see how we can use this cost breakdown information for decision making concerning many aspects of our motel operation. Even though a motel situation has been used, the same type of analysis can be

	Fixed	*Variable*
Employee wages	$105,600	$136,000
Management salary	40,000	
Laundry, linen, and guest supplies		77,400
Advertising	15,000	
Maintenance	30,800	3,800
Utilities	28,400	7,800
Office/telephone	7,000	1,000
Insurance	9,200	
Interest	16,600	
Property taxes	40,200	
Depreciation	70,000	
Totals	$362,800	$226,000

EXHIBIT 7.11

Final Cost Allocation by Fixed or Variable Costs

carried out equally well for a restaurant or a department in a hotel. In a hotel, the difficulty may be in allocating the overhead costs in an equitable manner to the individual departments.

COMPUTER APPLICATIONS

A computerized spreadsheet program can be used to apply most of the concepts discussed in this chapter. The formula for each concept has to be entered into the program only once, and it will automatically calculate the results for each situation. A spreadsheet can also be used to carry out the calculations necessary to separate costs into their fixed and variable elements, using all three methods outlined in this chapter.

SUMMARY

One way of increasing net income in a business is to increase sales revenue. Another way is to control costs. To do this, one must understand that there are different types of costs.

A direct cost is one that is the responsibility of, and is controllable by, a department head or department manager. An indirect cost, sometimes called an overhead cost, is not normally charged to an individual department. If such costs

are broken down by department and allocated to the departmental income statement, the resulting departmental profit or loss figure must be interpreted with great care.

All costs are controllable costs, whether they are direct or indirect ones; it is only the level of responsibility for control of a cost that changes whether a cost is controllable or noncontrollable.

A joint cost is one that is shared by two or more departments, or by the organization as a whole. A joint cost could be a direct one (such as wages) or an indirect one (such as building maintenance). A discretionary cost is one that can be incurred if a particular person, generally the manager, decides to spend the money. A relevant cost is one that needs to be considered when making a specific decision. If a cost makes no difference to the decision, then it is not relevant.

A sunk cost is a cost that is in the past and not relevant to certain decisions. The initial expenditure on a piece of equipment bought five years ago that will be traded in is a sunk cost insofar as the decision to buy a new machine today is concerned.

An opportunity cost is the income forgone by not doing something. A motel could run its own restaurant at a profit, or lease it out. If it runs it itself, the loss of rent income is an opportunity cost. However, the motel owner would happily endure this opportunity cost if net income from running the operation were greater than any potential rent income.

A standard cost is what a cost should be for a given level of revenue or volume of business. The final three types of cost discussed in this chapter were fixed costs, variable costs, and semifixed or semivariable costs. Fixed costs are costs that do not change in the short run, regardless of the volume of sales (the general manager's annual salary is an example). Variable costs are those that do vary in the short run and do so in direct proportion to sales (food and liquor costs are two good examples of variable costs). Most costs, however, do not fall neatly into either the fixed or the variable category; they are semifixed or semivariable costs. To make useful decisions concerning fixed and variable costs and their effect on net income at various levels of sales, the semicosts must be divided into their fixed and variable elements. Three methods were used to illustrate how this can be done.

- The high–low method, which, although quick and easy to use, may give misleading results if the high and low sales periods selected are not truly representative of the costs in all periods.
- The multipoint graph eliminates the possible problem built into the high–low method. The graph is subject to some element of personal judgment, but in most cases will give results that are close enough for most decision-making purposes.
- Regression analysis, which is the most accurate method, involves quite a number of calculations and can probably best be used as a spot check on the results of using one of the other two methods.

DISCUSSION QUESTIONS

1. Differentiate between a direct cost and an indirect cost.
2. Define discretionary cost and give two examples (other than those given in the text) of such a cost.
3. Differentiate between a fixed cost and a variable cost and give an example of each that is not in the text.
4. Why are some costs known as semifixed or semivariable?
5. Why might it not be wise to allocate an indirect cost to various departments on the basis of each department's sales revenue to total sales revenue?
6. What do you think might be the relevant costs to consider in deciding which one of a number of different vacuum cleaner models to buy for housekeeping purposes?
7. Explain why you think it sometimes makes sense to sell below cost.
8. Define the term high operating leverage and explain why, in times of increasing sales revenue, it is more profitable to have high rather than low operating leverage.
9. With figures of your own choosing, illustrate how the high–low calculation method can be used to separate the fixed and variable elements of a cost.
10. Explain why the high–low method may not be a good method to use to separate the fixed and variable portions of a cost.
11. Give a brief explanation of how to prepare a graph when using the multipoint graph method for separating the fixed and variable elements of a cost.

ETHICS SITUATION

A hotel owner decides that to control his costs he cannot offer employees a raise next year. However, they are not told that the hotel's manager has been offered a 10 percent increase in salary if he can convince the employees that the no-pay-raise policy is justified. He has agreed to do this and accept his raise. Discuss the ethics of this situation.

EXERCISES

E7.1 If revenue from a sale was $4,800 and variable costs were $2,304, what is the variable cost percentage?

E7.2 If sales revenue was $24,440 and variable costs were 42 percent, what is the contribution margin?

E7.3 You were asked to cater a buffet for 40 people at $15 per person, your variable costs average 75 percent, and fixed costs are $50 per day. Determine your contribution margin and operating income or loss and whether you will accept or reject the proposal.

E7.4 You have decided to allocate $14,000 of indirect costs to your café and bar operations based on square footage used. The café occupies 1,920 square feet and the bar occupies 480 square feet. How much of the $14,000 will be allocated to the café?

E7.5 Using the high–low method, find total fixed cost and the variable cost per guest if you had 14,000 and 10,000 guests, and labor costs were $15,500 and $12,000, respectively.

PROBLEMS

P7.1 You are planning to purchase a range and have to make a choice among the following three models:

	Model 1	*Model 2*	*Model 3*
Cash cost	$ 5,000	$ 5,500	$ 5,300
Estimate life	5 years	5 years	5 years
Trade-in value at end of life	$ 1,000	$ 1,200	$ 800
Cash from sale of old machine	$ 200	$ 200	$ 200
Installation of new machine	$ 75	$ 100	$ 100
Initial training cost in year 1	$ 350	$ 300	$ 250
Annual maintenance contract	$ 300	$ 275	$ 200
Annual cost of supplies	$ 200	$ 200	$ 200
Annual wage costs of employees	$32,000	$32,000	$32,000

Strictly on the basis of lowest cost over the five-year period, which model would be the best investment? (*Note:* In your calculations, ignore any costs that are not relevant.)

P7.2 The fixed cost of the banquet department of a hotel is $400 a day. A customer selected a menu for 100 persons that would have a food cost of $6.00 per person, a variable wage cost of $1.75 per person, and other variable costs of $0.25 per person.

a. Calculate the total cost per person if this banquet were booked.

b. What should be the total selling price (revenue) and the price per person if a 20 percent operating income on sales revenue is wanted?

c. The customer does not want to pay more than $11.25 per person for this function. She is a good customer; she has booked many

functions in the banquet room in the past and is expected to do so in the future. The function is three days from now, and there is no likelihood you will be able to book the room for any other function. Explain why you would, or would not, accept the $11.25 per-person price.

(*Note:* Assume that the hotel has only one banquet room.)

P7.3 You have the following monthly information about a large restaurant complex comprising three departments:

	Dining Room	***Coffee Shop***	***Lounge***	***Total***
Sales revenue	$184,800	$135,600	$152,900	$473,300
Direct costs	(154,600)	(129,000)	(127,600)	(411,200)
Department income	$ 30,200	$ 6,600	$ 25,300	$ 62,100
Indirect costs				(52,000)
Operating income				$ 10,100

The owner wants to allocate indirect costs to each department based on square footage to get a better picture of how each department is doing.

Dining room	1,200 sq. ft.
Coffee shop	840 sq. ft.
Lounge	960 sq. ft.

a. Allocate the indirect costs as indicated.

b. The owner has an offer from the souvenir store operator who is willing to rent the coffee shop space for $8,000 a year. Advise the owner whether to accept the offer.

c. Before making a final decision, the owner of the restaurant decides to evaluate the changes to indirect costs if the coffee shop space is rented.

Indirect Costs	***Present Costs***	***Costs if Coffee Shop Rented***
Administrative and general	$14,100	$13,400
Advertising and promotion	9,800	9,200
Utilities	4,500	4,300
Repairs and maintenance	4,200	3,900
Insurance	3,600	3,300
Interest	5,400	5,400
Depreciation	10,400	7,100

If the coffee shop is not operated, it is estimated that lounge revenue will decline by $13,600 a year and lounge direct costs will go down by $10,200. Dining room revenue and direct costs will not be affected. Should the owner accept the offer to rent out the coffee shop?

P7.4 You have the following income statements for each of the four quarters of a restaurant operation:

	1st Qtr.	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*
Sales revenue	$34,200	$44,800	$37,200	$20,300
Cost of sales	(12,800)	(16,900)	(14,700)	(8,400)
Gross Margin	$21,400	$27,900	$22,500	$11,900
Operating Expenses				
Wages	$ 9,800	$11,600	$10,200	$ 7,400
Supplies	1,600	1,900	1,700	900
Advertising	600	800	700	400
Utilities	2,500	2,900	2,600	1,900
Maintenance	300	400	300	200
Insurance	500	500	500	500
Interest	600	600	600	600
Depreciation	400	400	400	400
Rent	3,000	3,000	3,000	3,000
Total expenses	$19,300	$22,100	$20,000	$15,300
Operating income (loss)	$ 2,100	$ 5,800	$ 2,500	($ 3,400)

The owner is contemplating closing the restaurant in the fourth quarter in order to eliminate the loss and take a three-month vacation. The owner has asked for your help, and after an analysis of the fourth-quarter expenses, you determine the following:

- *Wages:* $3,000 is a fixed cost of key personnel who would be kept on the payroll even if the operation were closed for three months.
- *Supplies:* Cost varies directly with sales revenue; none of the supplies costs are fixed.
- *Advertising:* Half of the cost is fixed, the rest is variable.
- *Utilities:* Even if closed for three months, the restaurant will still require some heating; this is expected to cost $100 a month.
- *Maintenance:* Some light maintenance work could be done during the closed period; estimated cost $100.
- *Insurance:* Insurance cost will be reduced $200 if closed for three months.
- *Interest:* Will still have to be paid, even if closed.

- *Depreciation:* With less customer traffic and reduced wear and tear on equipment, there would be a 75 percent reduction in depreciation expense for the fourth quarter.
- *Rent:* This is an annual expense of $12,000 that must be paid regardless of whether the restaurant is open or closed.

Explain what advice you would give the owner.

P7.5 A company owns three motels in a ski resort area. Although there is some business during the summer months, the company finds it very difficult to staff the three operations during this period and is contemplating closing one of the three motels. The sales revenue and breakdown of costs during this period are as follows:

	Motel A	***Motel B***	***Motel C***
Sales revenue	$265,000	$325,000	$425,000
Variable costs	160,000	150,000	135,000
Fixed costs	110,000	167,000	260,000

a. Assuming one of the motels must be closed and that its closing will have no effect on the sales revenue of the other two, explain which motel should be closed and why.

b. Would your answer be the same if sales revenue remained as shown above and the variable and fixed costs changed as shown below?

	Motel A	***Motel B***	***Motel C***
Variable costs	$100,000	$167,000	$250,000
Fixed costs	110,000	113,000	112,000

P7.6 An entrepreneur is contemplating purchasing one of two similar competitive motels and has asked for your advice. Present revenue of each motel is $450,000 per year. Jack's motel has annual variable costs of 50 percent of sales revenue and fixed costs of $200,000; Jock's motel has annual variable costs of 60 percent of sales revenue and fixed costs of $155,000. The entrepreneur thinks that, if he purchased Jack's motel, he could save $10,000 a year on interest expense (a fixed cost). Alternatively, if he purchased Jock's motel, he could improve staff scheduling to the point that the wage saving would reduce total variable cost to 55 percent. In the case of either purchase, he thinks that sales revenue can be increased by 20 percent a year. Calculate the present net income of each motel, then, given these assumptions, advise the entrepreneur which one he should buy, including any cautionary comments.

P7.7 Stella's Steak House has been operating for the past 10 years, and Stella has to negotiate her lease on the premises for the next 5 years. Her options are to pay a fixed monthly rent of $2,500 or to pay a variable monthly rent of 6 percent of her sales. Over the next five years she anticipates her sales to average $550,000 per year.

a. What is Stella's indifference point on an annual sales revenue basis?

b. Which option should she choose? Explain.

P7.8 A hotel wishes to analyze its electricity cost in its rooms department in terms of fixed and variable elements. Monthly income statements show that during its busiest and slowest months, cost and rooms occupied information is as follows:

	Rooms Cost	*Rooms Sold*
Busiest	$2,600	2,400
Slowest	2,000	1,200

Use the high–low method to calculate the following:

a. Variable cost per room occupied

b. Total variable cost for the busiest and the slowest month

c. Total fixed cost per month

P7.9 You have the following information from the records of a restaurant:

	Sales Revenue	*Wage Costs*
January	$11,100	$5,500
February	13,100	5,900
March	14,900	6,100
April	19,100	7,100
May	22,000	9,000
June	24,200	9,600
July	26,300	9,700
August	27,000	9,900
September	23,900	8,500
October	20,100	7,600
November	18,200	8,000
December	16,000	7,100

Use the high–low method to calculate total fixed cost and total variable cost for the year.

P7.10 Complete a regression analysis to determine total annual fixed and variable costs using the sales revenue and wage costs shown in Problem 7.9. Compare regression analysis results with the results obtained

in Problem 7.9, and comment about the results between the two different methods used to find total annual fixed and variable costs.

P7.11 A restaurant has the following 12-month record of revenue and wages:

	Sales Revenue	*Wage Costs*
January	$24,900	$11,300
February	24,200	11,100
March	25,600	11,200
April	24,200	11,400
May	34,000	13,200
June	46,200	18,600
July	53,300	21,600
August	44,000	16,100
September	34,200	15,100
October	30,400	12,800
November	28,200	11,200
December	27,000	13,000

Adjustments to the base information shown: Included in the July wages is a lump sum retroactive wage increase of $2,400, which would not normally be part of the July wage cost. Also, in December, the restaurant catered a special Christmas function that brought in $3,200 in sales revenue, and cost the restaurant an additional $900 in wages. The December wage figure also included $1,200 in Christmas bonuses to the staff. Use the high–low method to calculate the restaurant's monthly fixed wage costs.

CASE 7

Charlie is thinking of spending $3,000 more in year 2004 on advertising (part of marketing expense). Because of his marketing courses, he believes he can design appealing advertisements to be placed in local newspapers and aimed at the business luncheon trade. He estimates that if the ads are placed, they will bring in 15 more people at lunch each day.

The average check for the additional lunch guests would be the same as that calculated in Case 6. Use a 52-week year and the days open from Case 6. Assume that the food and beverage total cost of sales percentage will be the same as in year 2004. (This percentage was calculated in Case 3.)

To serve the extra guests, a new employee will have to be hired at lunch for four hours. Hourly rate of pay including fringe benefits (a free meal while on duty, vacation pay, and so on) will be $5.42 an hour. The following variable

expenses will remain at the same percentage to sales revenue as they were in year 2004 (see Case 3):

- Laundry
- China and tableware
- Glassware
- Other operating expenses

All other expenses are assumed to be fixed and are unaffected by the increased volume of business. Prepare calculations to show whether the $3,000 should be spent. Refer to the income statement for the 4C Company's restaurant for year 2004.