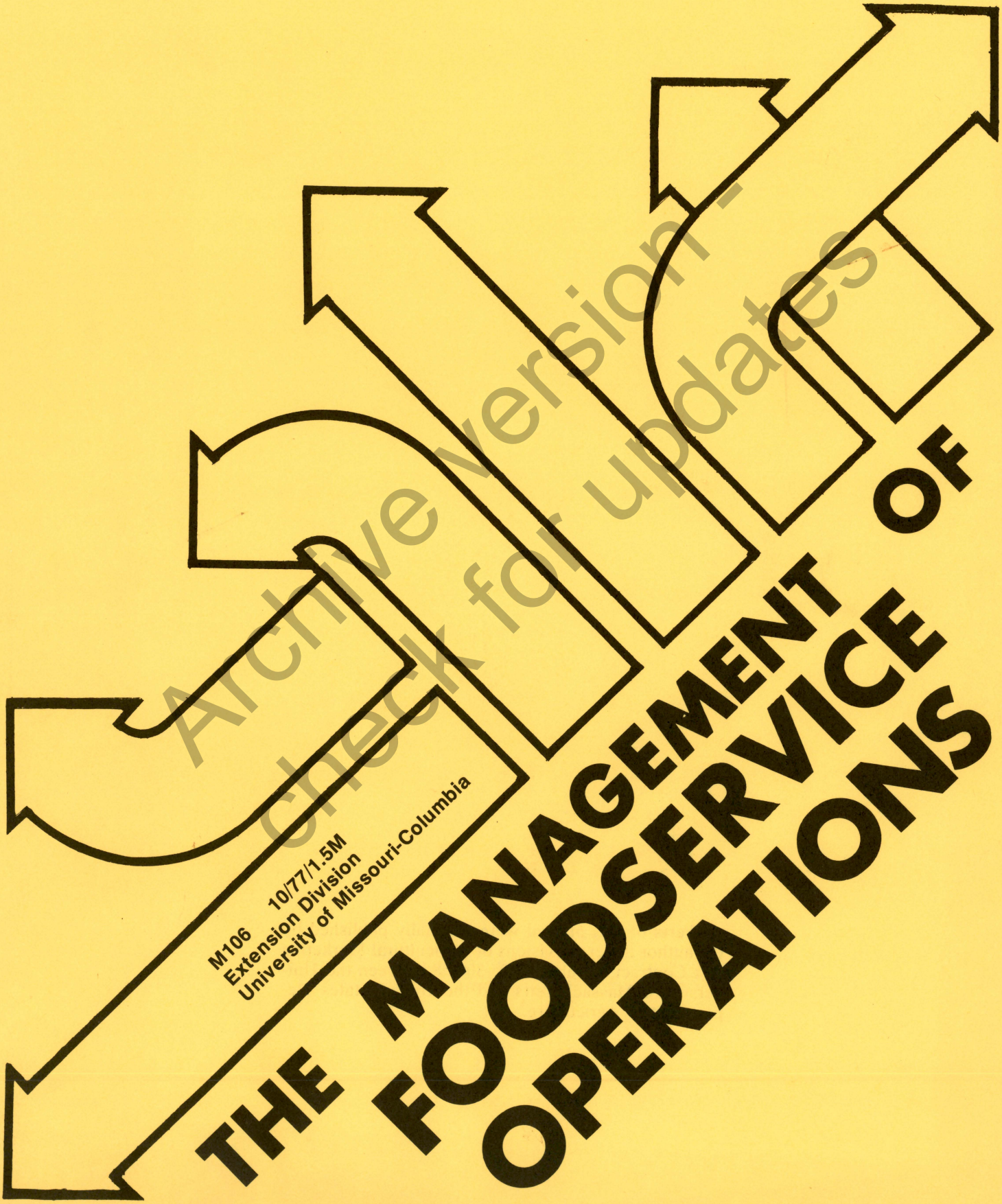
PROFIT PLANNING



THE MANAGEMENT OF FOODSERVICE OPERATIONS

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USING BREAK-EVEN ANALYSIS

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INTRODUCTION

This manual discusses some practical uses of break-even analysis in foodservice operations. It does not present the complete application of the use of the break-even system. This manual is designed primarily to make foodservice operators aware of the break-even concept as an effective managerial tool for profit planning.

You can't stay in business long if you don't make enough profit. This applies to operating a foodservice establishment just as much as to any other business.

Profits don't just happen. They must be planned, and the factors which affect profits need to be understood and business decisions made on the basis of that understanding.

A successful manager plans expenses and controls costs before they are incurred. He finds out what volume, combination of products, and quantities of labor can provide enough profit so there is an adequate return on the money invested in the business.

In other words, you need to analyze costs, volume, and profit and do it critically and objectively; and you need a method or tool for doing it.

There are a number of tools you can use to do this job. But one of the most effective is known as break-even analysis.

BREAK-EVEN ANALYSIS

Break-even analysis gets its name from the "break-even" point, where a business is just breaking even—neither making a profit nor incurring a loss. It is the point where the total expenses and the total income are equal. Every foodservice establishment, just as every other business, has such a break-even point.

The fact there is such a thing as a break-even point becomes highly important when you want to analyze the relationship of costs, volume, and profit. Knowing this relationship can help you make decisions which can produce future profits for your business.

Using break-even analysis a foodservice operator can determine the answers to questions such as these:

—What is my profit or loss at any given volume of sales?
—What volume of sales do I need, in order for the business to earn a predetermined rate of profit?
—What volume of sales do I need to offset a reduction of 5%, for example, in my selling price?
—What is my profit if fixed or variable expenses are decreased or increased?

It is a tool which you can use to find out a lot of things about your business, and then use this information to make decisions that enable the business to produce adequate profits.

Data You Need for Break-Even Analysis

You need certain kinds of data to apply break-even analysis to your operation. You find these data in statements and reports which are part of the routine business operation.

These data are for the most part operating data found in the Income Statement, or as it is more commonly called, the Profit-and-Loss Statement. However, the operating data, in the form in which they appear in the Profit-and-Loss Statement, are not detailed enough for break-even analysis. So, certain things must be done to these data to make the information more useful.

For one thing, the operating data must be separated into those costs which vary with volume (variable); and those which do not (fixed).

To do this requires some knowledge of the different kinds of costs and their characteristics, so that you can determine if a particular cost goes into one classification or the other.

Classifying Fixed and Variable Costs

Fixed Costs are the costs incurred for just being in business and they exist even if nothing is produced. These costs do not vary with changes in sales volume; they stay constant or fixed within a relevant range of sales volume. The volume of sales is held within the range by the size of the existing physical plant or equipment capacity.

Depreciation, insurance, rent, property taxes, and interest are usually included in fixed costs. Management can classify other costs as fixed costs. For example, advertising expense can be considered a fixed cost if management decides to budget a definite number of dollars for it in the year, regardless of what the volume of sales may be.

Variable Costs are those costs which change in direct proportion to the volume of sales. Direct materials (food), direct labor, and supplies are variable costs. As the volume of sales increases, you incur a proportionately higher amount of these costs. When volume of sales decreases, these costs decrease proportionally.

Determining Whether a Cost is Fixed or Variable

A good way to determine whether a cost is fixed or variable is to analyze the Chart of Accounts to find those expense accounts which will vary proportionately with volume, and those which will remain fixed for the budget period. The former are variable costs; the latter are fixed costs.

Semi-Variable Costs

One complication is provided by Semi-Variable Costs. These are costs which you can't classify as either fixed or variable. They contain a fixed element as well as a variable element.

Semi-Variable costs change as the volume of production or sales changes, but they do not change in direct proportion as variable costs do.

Utilities, supervision, and administrative expenses are examples of semi-variable costs. These expenses may increase by four or five percent in response to a 10 percent increase in the volume of sales.

But these costs have a fixed characteristic. If sales were to drop to zero, there would still be some part of the expenses remaining.

Since break-even analysis deals with only fixed and variable costs, something must be done with the semi-variable costs so they fit into these two classifications. They must be separated into their fixed and variable components. This can be done through various statistical methods or by what might be called an "educated guess."

How to Separate Semi-Variable Expenses

Various methods may be used to separate cost into fixed and variable components. One method of separating the fixed and variable cost elements of a semi-variable expense is the use of a scattergraph.

This statistical method gives a graphic picture of a relationship between the semi-variable expense and a variable base of activity such as: Sales Volume, Number of Covers Served, Direct Labor Cost, or Direct Labor Hours.

In this method, each semi-variable expense is analyzed to determine the variable rate of increase.

An Example

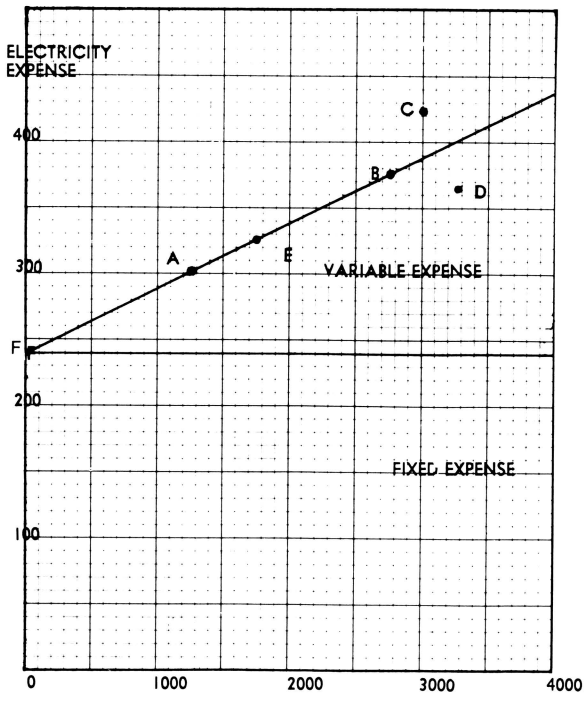
To determine the fixed and variable cost of electricity, you would do the following.

1. Collect the data for the electricity expense from your previous operating statements; and relate these data to the number of covers served, which is a variable base of activity. These data are shown in the first three columns below.

Time period	Number of Covers Served	Electricity Expenses	Plotted Points
1st 10 weeks	1,250	$ 300	A
2nd 10 weeks	2,750	375	B
3rd 10 weeks	3,000	425	C
4th 10 weeks	3,250	365	D
5th 10 weeks	1,750	325	E
Total	12,000	$1,790	

2. Using graph paper, construct a horizontal axis to represent the covers served, and a vertical axis to represent the electricity expense (See Figure 1). Plot the data from the chart onto the graph paper, measuring the number of covers served along the horizontal axis and the elec-

SCATTERGRAPH
OF
FIXED AND VARIABLE EXPENSES
(Per 10-Week Period)



NUMBER OF COVERS SERVED
Figure 1

tricity expense along the vertical axis. For each combination of number covers and electricity expense, there will be a point, and these points are marked A, B, C, D, and E.

Draw a straight line—a ruler is a must—so that it comes as close as possible to all of the points plotted on the chart. Some points will be above the line; some points will be on the line; and some points will be below the line. Draw the line so that the number above and below the line are about equal. It will be a sloping line.

What the Chart Shows

Now, what does this chart indicate? There are a number of things you can observe.

—The fixed portion of the electricity expense is at Point F where the line you draw intersects the vertical or Y axis, which represents electricity expense. The fixed portion of the expense is approximately $240 per 10-week period.

—The slope of the fitted line represents the variable cost rate of electricity expense per unit of production.

You can determine the variable cost rate per cover served from the completed chart in this way:

—Multiply $240 by 5 (the number of 10-week time periods) to determine the annual fixed cost, which is $1,200. This is $100 per month.

—Subtract the annual fixed cost of $1,200 from the annual total expense which is $1,790. The difference is $590.

—Divide the variable cost/component—$590—by the total number of covers which is 12,000. The .05 cents obtained is the variable cost rate per cover served.

With this information, you can estimate the amount of an expense at any level of activity. For example, if 850 covers are served in one month, the total expense would be $142.50. This is obtained as follows:

Fixed Cost for One Month + (Variable Cost Per Cover X Number of Covers) = Total Expense

$100 + .05 X 850 = $142.50

You can use this same technique to determine the fixed and variable elements of any activity or expense, such as sales, direct labor hours, direct labor cost, or the one used in the example—number of covers served. We could have computed the fixed and variable elements of electricity expense in relation to sales volume. This is a management decision, however, there should be some reasonable relationships between the unity of activity and the expense in question.

High-Low Method

This method of analyzing mixed costs requires that the cost involved be observed at high and low levels of activities within the relevant range. The difference in cost observed at the two extremes is divided by the change in level of activity in order to determine the amount of cost involved.

Using the data from our previous example, let's figure the variable rate of electricity.

	Number of Covers Served	Electricity Expense
High point observed	3,250	$425
Low point observed	1,250	300
Change observed	2,000	$125

$$\text{Variable Rate} = \frac{\text{Change in Cost}}{\text{Change in Activity}} = \frac{\$125}{2000} =$$

$.0625 Variable Cost per cover served

Having determined that the variable rate is $.0625 per cover served, it is now possible to determine the amount of fixed cost present:

Fixed Cost Element = Total Cost - Variable Cost
= $425 - (.0625 X 3,250)
= $425 - $203
= $222

Multiply $222 by 5 (the number of 10-week time periods) to determine annual fixed cost, which is $1,110 or $93 per month.

Both the variable and fixed cost element have now been isolated. The cost of electricity within the relevant range analyzed can be expressed as being $93 per month plus $.0625 per cover.

If a more scientific analysis is required, the Least Squares Method can be used. If we separated the variable cost from the fixed cost by the Least Squares method, the fixed cost element would be $101.65 or .05 cents variable cost per cover. The Least Squares Method is more accurate, but more complex. However, calculators are on the market today with the Least Squares Method built into them.

The Scattergraph and Least Squares Method are more accurate. While the High-Low Method is not so sophisticated it will give reliable results if the expense varies at the uniform rate. With the fixed and variable cost elements separated, it is now possible to proceed with the break-even analysis.

CALCULATION OF BREAK-EVEN POINT ANALYSIS

After you analyze the semi-variable expenses and classify the fixed and variable costs, you can use either a mathematical or graphical method to determine the break-even point. Either method will provide information to help you see more clearly the relationship of cost, volume, and profit.

Mathematical Calculation of the Break-Even Point

Four steps are involved in calculating the break-even point.

Step No. 1—Determine the net sales, fixed expenses, and variable expense incurred for a past period.

Step No. 2—Calculate the percentage of variable expense to net sales.

In the profit-and-loss statement on page 7, net sales are $100,000, and the variable expense is $68,000. Therefore, the variable expense is 68% of net sales.

$68,000 ÷ $100,000 = 68%

Step No. 3—Subtract this percentage figure, 68%, from 100%. This indicates that 32%, or 32 cents of every sales dollar, remains to cover fixed expenses and profit.

This percentage figure is known by several names—marginal income ratio, contribution ratio, and profit volume ratio (PV). It remains the same for all levels of volume, as long as the selling price, variable expense, and fixed expense remain the same.

Step No. 4—Divide the dollar amount of fixed expense, $24,000, by the 32% which was calculated in Step 3. This gives the break-even point of $75,000.

$24,000 ÷ 32% = $75,000

This four-step calculation of the break-even point can be expressed in the following basic break-even formula.

$$\text{Break-Even Point (B.E.P.)} = \frac{\text{Fixed Cost}}{\frac{\text{1 (100\%) Variable Cost}}{\text{Sales}}}$$

An Example

As an example of how this formula is used, substitute in the break-even formula the following data from the profit-and-loss statement for the Ferenstance Restaurant on page 7.

Fixed cost = $24,000
Variable cost = $68,000
Sales = $100,000

Substituting the figures in the formula:

$$\text{B.E.P.} = \frac{\$24{,}000}{\frac{1 - \$68{,}000}{\$100{,}000}}$$

$$\text{B.E.P.} = \frac{\$24{,}000}{1 - 68\%}$$

$$\text{B.E.P.} = \frac{\$24{,}000}{32\%}$$

B.E.P. = $75,000

At this point, the $75,000 of sales are equal to the fixed and variable costs. There is neither a profit nor a loss.

You can prove the calculation in this way:

Sales	$75,000
Less Variable Cost (68% of Sales)	$51,000
Gross Profit	$24,000
Less Fixed Costs	$24,000
Profit or Loss	0

This can be expressed as follows:

Sales - Variable Cost = Gross Profit - Fixed Costs = 0
$75,000 - $51,000 = $24,000 - $24,000 = 0 (Break-Even)

Basic Assumptions of Break-Even Analysis

The break-even point of a foodservice establishment can be calculated in this manner with a fair degree of accuracy. The effectiveness of the break-even analysis depends, however, on certain basic assumptions relating to costs and profits.

These are as follows:

1. The selling price will not change
2. The sales mix will remain constant
3. Costs can be classified into fixed and variable classifications with reasonable accuracy.
4. Variable costs will vary in direct proportion to volume within the limits of the study.
5. Fixed costs will remain constant within the limits of the study.

If any of these basic assumptions is altered, then break-even analysis will not provide the valuable information indicated.

Uses of Break-Even Analysis

When you know and understand the relationship of cost, volume, and profit, you can project future profits at various sale volumes, and you can budget the operation accordingly.

On page 3, some questions were listed, and it was stated that break-even analysis can be used to provide answers to these and similar questions.

FERENSTANCE RESTAURANT
PROFIT AND LOSS STATEMENT
For the Year Ending December 31, _____

	Amount	Percent Ratio	Classification of Expenses: Fixed	Classification of Expenses: Variable
NET FOOD SALE	$100,000	100.0%		$39,000
Cost of Food Sold	39,000	39.0		
GROSS PROFIT	$ 61,000	61.0%		
OPERATING EXPENSES—CONTROLLABLE				
Salaries and Wages	$ 30,000	30.0%	$ 6,000	$24,000
Laundry, Linen and Uniforms	2,400	2.4	1,700	700
China, Glass and Silver	1,500	1.5	1,000	500
Cleaning and Other Supplies	900	.9	400	500
Utilities	2,400	2.4	800	1,600
Repairs and Maintenance	1,100	1.1		1,600
Advertising and Promotion	1,000	1.0	1,000	
Administration and General	2,400	2.4	1,800	600
Total Operating Expense	$ 41,700	41.7%		
GROSS OPERATING PROFIT	19,300	19.3		
FIXED EXPENSES				
Rent	$ 5,000	5.0%	$ 5,000	
Property Taxes and Licenses	1,500	1.5	1,500	
Insurance	400	.4	400	
Interest	900	.9	900	
Depreciation	3,500	3.5	3,500	
Total Fixed Costs	$ 11,300	11.0%	$24,000	$68,000
NET PROFIT BEFORE TAXES	$ 8,000	8.0%		

How this can be done is illustrated, using the data found in the profit-and-loss statement for the Ferenstance Restaurant, above.

Question Number 1

What is my profit before taxes at a sales volume of $120,000?

Answer

The data in the Ferenstance Restaurant profit-and-loss statement shows:

Profit Volume Ratio = 32%
Fixed Costs = $24,000

The desired sales volume is:

Projected Sales = $120,000

The following calculation provides the answer:

Sales X Profit Volume Ratio Fixed Costs = Profit

Projected Sales	$120,000
Profit Volume Ratio	X .32
Contribution	$ 38,400
Less Fixed Costs	$ 24,000
Profit	$ 14,400

Thus, profit before taxes at a sales volume of $120,000 would be $14,400.

Question Number 2

What sales volume do I need to earn a predetermined rate of profit?

The foodservice operator decides a profit of $10,000 a year is a fair return for his effort. What sales volume is necessary to earn it?

Answer

In effect, the $10,000 becomes a fixed cost. The data in the Ferenstance Restaurant Profit-and-loss statement show:

Fixed Cost	= $24,000
Profit Volume Ratio	= 32%
Desired Profit	= $10,000

The following calculation provides the answer:

$$\text{Required sales volume} = \frac{\text{Fixed Costs + Profit}}{\text{Profit Volume Ratio}}$$

$$= \frac{\$24,000 + \$10,000}{32\%}$$

$$= \frac{\$34,000}{.32}$$

$$= \$106,250$$

Question Number 3

What sales volume do I need to offset a 5% reduction in selling price without reducing profits?

Answer

Referring to the data in the previous illustration, the following facts are known:

Sales	= $106,250
Profit Volume Ratio	= 32%
Fixed Costs	= $24,000

It is necessary to make two calculations to obtain the answer.

1. The following calculation provides the present operating profit.

   Sales X Profit Volume Ratio - Fixed Costs = Profit

   $106,250 X .32 - $24,000 = $10,000

Sales	$106,250
Profit Volume Ratio	X .32
Contribution	$ 34,000
Less Fixed Costs	$ 24,000
Profit	$ 10,000

2. The second calculation adjusts for the 5% reduction in selling price.

$$\text{Required Sales Volume} = \frac{\text{Desired Profit + Fixed Costs}}{1 - \frac{\text{Present Variable Cost Percent}}{\text{1 - Proposed Reduction (\%)}}}$$

$$= \frac{\$10,000 + \$24,000}{1 - \frac{.68}{1\text{-}5\%}}$$

$$= \frac{\$34,000}{1 - \frac{.68}{.95}}$$

$$= \frac{\$34,000}{1 - .716}$$

$$= \frac{\$34,000}{.284}$$

$$= \$119,718$$

Thus, the sales volume needed to offset a 5% reduction in selling price represents an increase of approximately 13% in sales.

Key to decisions on reducing selling prices is the ability to attain the increased volume of sales. The capacity of the foodservice establishment to produce the increased number of covers served is a vital factor.

Question Number 4

What is my profit if fixed and variable costs change?

Assume that a foodservice operator, through the purchase of new equipment, is able to reduce his variable costs by 20%. This new equipment increases his fixed costs by $3,000. What is the profit, if sales total $100,000?

Answer

Three calculations are necessary.

1. The first step is to determine a new Profit Volume Ratio. The present variable costs are 68% of sales. So, a 20% reduction in variable costs would be (.68 less 20% of .68) or 54.4%.

   .68 - .20 (.68) = 54.4%

   Thus, the new Profit Volume Ratio is 1 (100%) - 54.4% = 44.6%

2. Then, using the break-even formula:

$$\frac{\text{Fixed Costs}}{\text{Profit Volume Ratio}}$$

$$\frac{\$24,000 \text{ (present fixed costs)} + \$3,000 \text{ (new fixed costs)}}{44.6\%} = \frac{\$27,000}{.446}$$

The new break-even point is $60,540.

3. The following calculation is made to determine the profit.

   Sales X Profit Volume Ratio - Fixed Costs = Profit

   $100,000 X .446 - $27,000 = $17,600

   The profit is $17,600

Note that the 44.6% Profit Volume Ratio results in a larger profit at $100,000 Sales ($17,600) than the 32% Profit Volume Ratio ($8,000) at the same level of Sales.

—As sales exceed the break-even point, the higher profit volume ratio will result in greater profits.

—As sales fall below the break-even point, the higher profit volume ratio will result in greater losses.

Other Uses of Break-Even Analysis

Let's say the owner of the Ferenstance Restaurant decides to install a bar just off the dining room by remodeling a meeting room for this purpose.

The cost of installing the bar will be $10,000 which will be written off in five years. Additional payroll (minimum) will come to $7,800 for the year. Moreover, the owner estimates that increased fixed expenses such as employees' benefits, administrative overhead, the cost of space (rent), interest and insurance will cost $150 per week or $7,800 per year. How much volume must he do per month to break-even?

In this example, all our costs are fixed. Payroll is fixed because it is the minimum amount needed to open the bar daily.

Payroll	$ 650
Other Expenses	$ 650
Depreciation	$ 167
Total	$1,467

Depreciation expense was calculated as follows:

$10,000 ÷ 5 years = $2,000 per year ÷ 12 months

The owner has decided that his beverage cost should be about 30% of sales. Therefore, his Profit Volume Ratio is 70% (100%-30%). Therefore, the break-even point per month will be $2,096.

$$\text{B.E.P.} = \frac{\text{Fixed Costs}}{\text{Profit Volume Ratio}}$$

$$= \frac{\$1,467}{.70}$$

$$= \$2,096$$

If the average cost per drink is $1.50, then he will have to sell on the average 1,397 drinks per month or 325 drinks per week (1,397 ÷ 4.3) to break-even.

To realize a $900 profit per month, he will divide $900 by 70% (P.V.R.) which tells him he has to sell an additional 1,286 drinks per month. Therefore, to achieve the $900 profit objective, he has to sell 2,683 drinks per month (1,397 + 1,286) or $4,025 in sales.

If the owner feels that the profit objective is feasible he will add the bar. If he feels it is not feasible but still wants the bar, adjustments can be made in the profit objective, or he can install the bar perhaps on a smaller scale requiring less fixed costs.

USING THE BREAK-EVEN POINT FORMULA TO DETERMINE THE CLOSING POINT

If you want to know the "closing point" of your foodservice operation, or the unprofitable hours of operation, the use of the formula, with a slight adjustment, can provide the answers.

The closing point of an operation is that point where total sales equal the minimum cost of being open. If total sales are less than the cost of being open you are losing money needlessly.

Determining the Closing Point

In determining the closing point, you disregard fixed costs, since these costs exist whether the foodservice establishment is open or closed.

To determine the closing point for a day or month, determine the minimum operating costs for a day. These costs, sometimes called "opening costs," are incurred when the foodservice establishment opens its doors to the public.

Assume that the following figures are the minimum operating costs for a day:

Food Cost	40% of sales
Payroll	30% of sales
Other Variable Costs	10% of sales
Fixed Costs	$40
Total Costs	$40 + 80% of sales

The mathematical computation of the closing point requires one figure stated in dollars. Since the fixed costs are eliminated in determining the closing point, you will need to state another expense in dollars. Payroll is the easiest one to state in terms of dollars, since you can readily determine your minimum operating staff.

Assume that the payroll for a minimum operating staff is $42.50 for the day; and that the "other variable costs" are approximately 8% because some of these costs are fixed (semi-variable).

The minimum operating costs are now:

Food Cost	40%	
Payroll (minimum)		$42.50
Other Variable Costs	8%	
Total (Minimum Operating Costs)	48% +	$42.50

Based on these figures, you can use the break-even formula to determine the closing point.

$$\text{Closing Point} = \frac{\text{Minimum Operating Costs (\$)}}{1 - \text{Minimum Operating Costs (\%)}}$$

$$= \frac{\$42.50}{1 - .48}$$

$$= \frac{\$42.50}{.52}$$

$$= \$81.70$$

The closing point is approximately $82 in sales per day. If you have sales less than this amount, you lose more by opening than if you remained closed for the day.

Here is another example:

Jim Smith owns a restaurant on a Missouri highway. It is well traveled during the summer months, and he enjoys an excellent business. However, he finds that the month of March represents a low point in his sales. He is an ardent fisherman. He is debating whether he would lose more by remaining open or by simply closing up shop and going fishing in Florida during March.

Analyzing his operating statements, Jim finds that his costs average as follows:

Food Cost	40%
Payroll a Minimum of $1,300 or	25% - whichever is greater
Other Variable Costs	2%
Utilities, phone, supplies, repairs, maintenance, etc.	7%
Fixed costs: rent, taxes, licenses, insurance, interest depreciation etc.	$1,250

From Jim's past experience and records, he has determined that his March sales cannot be expected to exceed $2,000. Should he decide to close for the month of March, he finds that the cost of utilities, including watchman service, heat and electricity for security lighting and freezer operation would run $150 for the month.

Question

Would Jim lose more money by closing or by remaining open for the month of March? How much?

Answer

Let's determine Jim's closing point first. Since we disregard fixed costs, we must use payroll since it is expressed in dollars. The minimum payroll for any month is $1,300.

The minimum operating costs are:

Food Cost	40%	
Payroll (minimum)		$1,300
Other Variable Costs	9%	
Total	49% +	$1,300

The closing point is $2,549 ($1,300 ÷ 51%).

Would Jim lose more money by closing or by remaining open for the month of March? How much? If you said Jim would lose more money by remaining open, you are right. If you said he would lose $549, you are not quite right. He would lose $280. Let's check it out.

Jim's minimum operating costs are $1,300 plus 49% of sales. Sales for March are not expected to exceed $2,000. Therefore:

$2,000 X 49% = $980 + $1,300 = $2,280

Jim's opening costs are $2,280 for an expected $2,000 in sales. Jim would be better off going fishing. It will only cost him $150.

By using the closing point formula, you can also determine if it is profitable to open your food-service establishment for breakfast or to stay open later in the evening. All you have to do is analyze your food costs, labor costs, and variable costs for the time period in question.

GRAPHICAL DETERMINATION OF BREAK-EVEN POINT

You can also determine the break-even point by using a graphical presentation, and it will provide the same information that you get from using the mathematical formula.

Constructing a Break-Even Chart

There are three steps to constructing a conventional break-even chart.

The following figures will be used to illustrate how this is done:

Sales		$50,000
Less costs and expenses		
Food Cost	$20,000	
Variable Expenses	$11,000	
Fixed Costs	$15,000	
Total Expenses		$46,000
Net Profit before taxes		$ 4,000

Step 1. Using graph paper, construct a horizontal axis and a vertical axis as in the graph on page (Figure II). On the horizontal axis, mark off a scale in terms of dollars for the expense. Draw the fixed expense line from point A to point A^1, so that it is parallel to the horizontal axis.

This line represents the fixed expense at all levels of sales.

Step 2. Plot the total expenses at Point B.

This point represents the total fixed costs and variable costs ($46,000) on the vertical axis, at $50,000 sales volume. Draw a line between Point A and Point B. This is Line B.

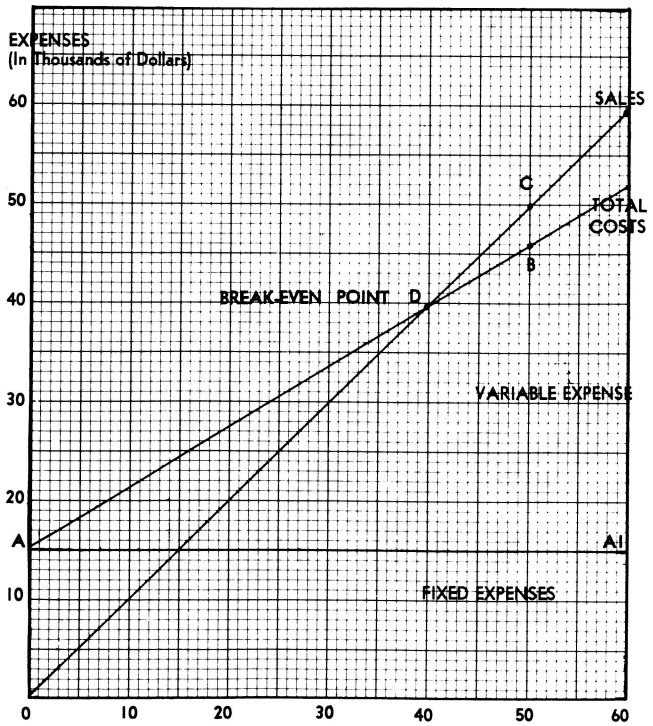
The area between Line B and Line A represents the variable expense at different levels of sales.

Step 3. Plot Point C at the point where total expenses on the vertical axis represent total sales on the horizontal axis. Draw a straight line from 0 through C. This is Line C.

The break-even point is at D, where the total cost (T.C) line (Line B) intersects the income line (Line C).

The amount of sales necessary to break-even is approximately $40,000 ($39,474).

CONVENTIONAL
BREAK-EVEN CHART



SALES VOLUME
(IN THOUSANDS OF DOLLARS)
Figure II

To determine the profit, count the squares between C and B. Since each square represents $1,000, and there are four squares between C and B, the profit at a sales volume of $50,000 is $4,000.

Constructing a Daily Break-Even Chart

You can plot a simple daily break-even chart on graph paper, using figures obtained from the profit-and-loss statement. In preparing this chart, it is not necessary to separate the fixed and variable costs. Use only the average daily sales and the average daily profit.

Assume that the following figures represent the business activity which has occurred in the previous three months.

	Month Number 1	Month Number 2	Month Number 3
Monthly Sales	$7,595	$8,400	$9,300
Number of Operating Days	31	30	31
Average Sales Per Day	245	280	300
Monthly Profit	775	1,050	1,250
Average Daily Profit	25	35	40

The steps in preparing a daily break-even chart are basically the same as those followed in constructing the conventional break-even chart (See Figure III, page 12).

Plot the sales line, Point 0 to Point Y, in the same way as for the conventional break-even chart.

Plot average sales per day, S1, S2, and S3, on the sales line, Point 0 to Point Y.

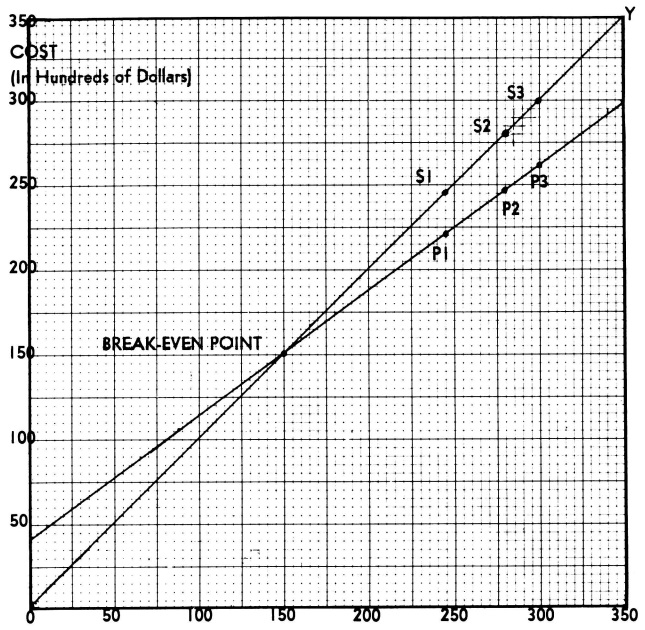
Each square on the chart is equivalent to $5.00. Plot the average daily profit (P) directly under the respective period using the squares as a guide. Since each square is equivalent to $5.00, and the average daily profit for S3 was $40.00, a point (P3) is plotted eight squares directly under S3 ($300 average sales per day); another (P2) is located seven squares under S2; and a third (P1) is plotted five squares under S1.

Draw a line connecting Points, P1, P2, and P3. You may not be able to connect all the points with a straight line, if the sales and profit figures are used for a longer period than two months. So draw a line of "best fit," or draw a straight line through the high-profit and low-profit points.

The break-even point is where the sales and profit lines cross each other. In this example, the break-even point in sales is approximately $150 per day.

You can determine from this chart the profit at various sales levels by counting the squares between the sales line and the profit line.

DAILY BREAK-EVEN CHART



SALES (IN HUNDREDS OF DOLLARS)
Figure III

For example, at $325 sales per day, the profit would be approximately $47.00 (9½ squares X $5.00).

You can use this chart to determine profit under various assumed conditions.

The chart is easy to construct and interpret. It is not as accurate as a detailed analysis of the operation's fixed and variable costs. While it is not as accurate as the mathematical formula, it does present a good operational picture of the establishment.

SUMMARY

Break-even analysis offers an effective management tool for projecting income, expense, and profit under assumed conditions. It is a method of putting facts and figures to work to gain more effective decision making. It enables you to understand the inter-relationships of volume, costs, and profits.

The break-even point can be computed either graphically or mathematically.

There are limitations to the use of break-even analysis. Break-even analysis requires that you know your costs. These costs must be separated into fixed and variable classifications. This sometimes presents a difficulty because semi-variable expenses must be separated into their fixed and variable components.

Break-even analysis must be interpreted in light of the basic assumptions underlying the break-even concept. Break-even analysis is more effective for short-range planning than for long-range planning, since a forecast of future revenues and expenses tends to be unreliable.

Knowing what the break-even point is will not solve management problems in itself. It is not a substitute for management thinking, but it is a tool which can aid management in making approximate forecasts of alternative programs.

When these limitations are understood, you can get much value from break-even point analysis in planning for and controlling the factors that affect profits in the foodservice establishment.

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