CHAPTER 2

Financial Aspects of Marketing Management

Marketing managers are accountable for the impact of their actions on profits. Therefore, they need a working knowledge of basic accounting and finance. This chapter provides an overview of several concepts from managerial accounting and managerial finance that are useful in marketing management: (1) variable and fixed costs, (2) relevant and sunk costs, (3) margins, (4) contribution analysis, (5) liquidity, (6) operating leverage, and (7) discounted cash flow. In addition, considerations when preparing *pro forma* income statements are described.

■ VARIABLE AND FIXED COSTS

An organization's costs divide into two broad categories: variable costs and fixed costs.

Variable Costs

Variable costs are expenses that are uniform per unit of output within a relevant time period (usually defined as a budget year); yet total variable costs fluctuate in direct proportion to the output volume of units produced. In other words, as volume increases, total variable costs increase.

Variable costs are divided into two categories, one of which is *cost of goods sold*. For a manufacturer or a provider of a service, cost of goods sold covers materials, labor, and factory overhead applied directly to production. For a reseller (wholesaler or retailer), cost of goods sold consists primarily of the cost of merchandise. The second category of variable costs consists of expenses that are not directly tied to production but that nevertheless vary directly with volume. Examples include sales commissions, discounts, and delivery expenses.

Fixed Costs

Fixed costs are expenses that do not fluctuate with output volume within a relevant time period (the budget year) but become progressively smaller per unit of output as volume increases. The decrease in per-unit fixed cost results from the increase in the number of output units over which fixed costs are allocated. Note, however, that no matter how large volume becomes, the absolute size of fixed costs remains unchanged.

Fixed costs divide into two categories: programmed costs and committed costs. *Programmed costs* result from attempts to generate sales volume. *Marketing expenditures are generally classified as programmed costs.* Examples include advertising, sales promotion, and sales salaries. *Committed costs* are those required to maintain the organization. They are usually nonmarketing expenditures such as rent and administrative and clerical salaries.

It is important to understand the concept of fixed cost. Remember that total fixed costs do not change during a budget year, regardless of changes in volume. Once fixed expenditures for a marketing program have been made, they remain the same whether or not the program causes unit volume to change.

Despite the clear-cut classification of costs into variable and fixed categories suggested here, cost classification is not always apparent in actual practice. Many times costs have a fixed and a variable component. For example, selling expenses often have a fixed component (such as salary) and a variable component (such as commissions or bonus) that are not always evident at first glance.

■ RELEVANT AND SUNK COSTS

Relevant Costs

Relevant costs are expenditures that (1) are expected to occur in the future as a result of some marketing action and (2) differ among marketing alternatives being considered. In short, relevant costs are future expenditures unique to the decision alternatives under consideration.

The concept of relevant cost can best be illustrated by an example. Suppose a manager considers adding a new product to the product mix. Relevant costs include potential expenditures for manufacturing and marketing the product, plus salary costs arising from the time sales personnel give to the new product at the expense of other products. If this additional product does not affect the salary costs of sales personnel, salaries are not a relevant cost.

As a general rule, opportunity costs are also relevant costs. Opportunity costs are the forgone benefits from an alternative not chosen.

Sunk Costs

Sunk costs are the direct opposite of relevant costs. Sunk costs are past expenditures for a given activity and are typically irrelevant in whole or in part to future decisions. In a marketing context, sunk costs include past research and development expenditures (including test marketing) and last year's advertising expense. These expenditures, although real, will neither recur in the future nor influence future expenditures. When marketing managers attempt to incorporate sunk costs into future decisions affecting new expenditures, they often fall prey to the *sunk cost fallacy*—that is, they attempt to recoup spent dollars by spending still more dollars in the future.

■ MARGINS

Another useful concept for marketing managers is that of *margin*, which refers to the difference between the selling price and the "cost" of a product or service. Margins are expressed on a total volume basis or on an individual unit basis, in dollar terms or as percentages. The three described here are gross, trade, and net profit margins.

Gross Margin

Gross margin, or gross profit, is the difference between total sales revenue and total cost of goods sold, or, on a per-unit basis, the difference between unit selling price and unit cost of goods sold. Gross margin may be expressed in dollar terms or as a percentage.

Total Gross Margin	***Dollar Amount***	***Percentage***
Net sales	$100	100%
Cost of goods sold	-40	-40
Gross profit margin	$60	60%
Unit Gross Margin		
Unit sales price	$1.00	100%
Unit cost of goods sold	-0.40	-40
Unit gross profit margin	$0.60	60%

Gross margin analysis is a useful tool because it implicitly includes unit selling prices of products or services, unit costs, and unit volume. A decrease in gross margin is of immediate concern to a marketing manager because such a change has a direct impact on profits, providing that other expenditures remain unchanged. Changes in total gross margin should be examined in depth to determine whether the change was brought about by fluctuations in unit volume, changes in unit price or unit cost of goods sold, or a modification in the sales mix of the firm's products or services.

Trade Margin

Trade margin is the difference between unit sales price and unit cost at each level of a marketing channel (for example, manufacturer → wholesaler → retailer). A trade margin is frequently referred to as a *markup* or *mark-on* by channel members, and it is often expressed as a percentage.

Trade margins are occasionally confusing, since the margin percentage can be computed on the basis of cost or selling price. Consider the following example. Suppose a retailer purchases an item for $10 and sells it at a price of $20—that is, a $10 margin. What is the retailer's margin percentage?

Retailer margin as a percentage of cost is

$$\frac{\$10}{\$10} \times 100 = 100 \text{ percent}$$

Retailer margin as a percentage of selling price is

$$\frac{\$10}{\$20} \times 100 = 50 \text{ percent}$$

Differences in margin percentages show the importance of knowing the base (cost or selling price) on which the margin percentage is determined. *Trade margin percentages are usually determined on the basis of selling price*, but practices do vary among firms and industries.

Trade margins affect the pricing of individual items in two ways. First, suppose a wholesaler purchases an item for $2.00 and seeks to achieve a 30 percent margin on this item based on selling price. What would be the selling price?

$2.00 = 70 percent of selling price

or

Selling price = $2.00/0.70 = $2.86

Second, suppose a manufacturer suggests a retail list price of $6.00 on an item for ultimate resale to the consumer. The item will be sold through retailers whose policy is to obtain a 40 percent margin based on selling price. For what price must the manufacturer sell the item to the retailer?

$$\frac{x}{\$6.00} = 40 \text{ percent of selling price}$$

where x is the retailer margin. Solving for x indicates that the retailer must obtain $2.40 for this item. Therefore, the manufacturer must set the price to the retailer at $3.60 ($6.00 - $2.40).

The manufacturer's problem of suggesting a price for ultimate resale to the consumer becomes more complex as the number of intermediaries between the manufacturer and the final consumer increases. This complexity can be illustrated by expanding the above example to include a wholesaler between the manufacturer and retailer. The retailer receives a 40 percent margin on the sales price. If the retailer must receive $2.40 per unit, the wholesaler must sell the item for $3.60 per unit. In order for the wholesaler to receive a 20 percent margin, for what price must the manufacturer sell the unit to the wholesaler?

$$\frac{x}{\$3.60} = 20 \text{ percent wholesaler margin on selling price}$$

where x is the wholesaler margin. Solving for x shows that the wholesaler's margin is $0.72 for this item. Therefore, the manufacturer must set the price to the wholesaler at $2.88.

This example shows that a manager must work backward from the ultimate price to the consumer through the marketing channel to arrive at a product's selling price. Assuming that the manufacturer's cost of goods sold is $2.00, we can calculate the following margins, which incidentally show the manufacturer's gross margin of 30.6 percent.

	Unit Cost of Goods Sold	*Unit Selling Price*	*Gross Margin as a Percentage of Selling Price*
Manufacturer	$2.00	$2.88	30.6%
Wholesaler	2.88	3.60	20.0
Retailer	3.60	6.00	40.0
Consumer	6.00		

Net Profit Margin (Before Taxes)

The last margin to be considered is the net profit margin before taxes. This margin is expressed as a dollar figure or a percentage. *Net profit margin* is the remainder after cost of goods sold, other variable costs, and fixed costs have been subtracted from sales revenue. The place of net profit margin in an organization's income statement is illustrated by the following:

	Dollar Amount	*Percentage*
Net sales	$100,000	100%
Cost of goods sold	-30,000	-30
Gross profit margin	$70,000	70%
Selling expenses	-20,000	-20
Fixed expenses	-40,000	-40
Net profit margin	$10,000	10%

Net profit margin dollars represent a major source of funding for the organization. As will be shown later, net profit influences the working capital position of the organization; hence, the dollar amount ultimately affects the organization's ability to pay its cost of goods sold plus its selling and administrative expenses. Furthermore, net profit also affects the organization's cash flow position.

■ CONTRIBUTION ANALYSIS

Contribution analysis is an important concept in marketing management. *Contribution* is the difference between total sales revenue and total variable costs, or, on a per-unit basis, the difference between unit selling price and unit variable cost. Contribution analysis is particularly useful in assessing relationships among costs, prices, and volumes of products and services.

Break-Even Analysis

Break-even analysis is one of the simplest applications of contribution analysis. *Break-even analysis* identifies the unit or dollar sales volume at which an organization neither makes a profit nor incurs a loss. Stated in equation form:

Total revenue = total variable costs + total fixed costs

Since break-even analysis identifies the level of sales volume at which total costs (fixed and variable) and total revenue are equal, it is a valuable tool for evaluating an organization's profit goals and assessing the riskiness of actions.

Break-even analysis requires three pieces of information: (1) an estimate of unit variable costs, (2) an estimate of the total dollar fixed costs to produce and market the product or service unit (note that only relevant costs apply), and (3) the selling price for each product or service unit.

The formula for determining the number of units required to break even is as follows:

$$\text{Unit break-even volume} = \frac{\text{total dollar fixed costs}}{\text{unit selling price} - \text{unit variable costs}}$$

The denominator in this formula (unit selling price minus unit variable costs) is called *contribution per unit*. Contribution per unit is the dollar amount that each unit sold "contributes" to the payment of fixed costs.

Consider the following example. A manufacturer plans to sell a product for $5.00. The unit variable costs are $2.00, and total fixed costs assigned to the product are $30,000. How many units must be sold to break even?

$$\begin{aligned}\text{Fixed costs} &= \$30{,}000\\ \text{Contribution per unit} &= \text{unit selling price} - \text{unit variable cost}\\ &= \$5 - \$2 = \$3\\ \text{Unit break-even volume} &= \$30{,}000/\$3 = 10{,}000 \text{ units}\end{aligned}$$

This example shows that for every unit sold at $5.00, $2.00 is used to pay variable costs. The balance of $3.00 "contributes" to fixed costs.

A related question is what the manufacturer's dollar sales volume must be to break even. The manager need only multiply unit break-even volume by the unit selling price to determine the dollar break-even volume: 10,000 units × $5 = $50,000.

A manager can calculate a dollar break-even point directly without first computing unit break-even volume. First, the *contribution margin* must be determined from the formula:

$$\text{Contribution margin} = \frac{\text{unit selling price} - \text{unit variable cost}}{\text{unit selling price}}$$

Using the figures from our example, we find that the contribution margin is 60 percent:

$$\text{Contribution margin} = \frac{\$5 - \$2}{\$5} = 60 \text{ percent}$$

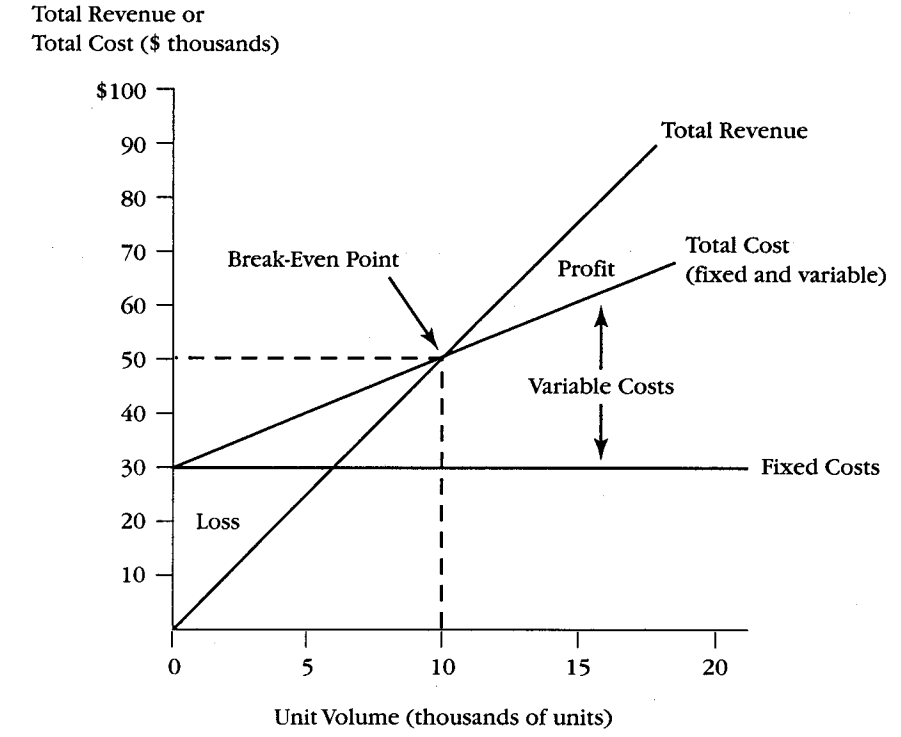
Then the dollar break-even point is computed as follows:

$$\text{Break-even dollar volume} = \frac{\text{total fixed costs}}{\text{contribution margin}} = \frac{\$30,000}{0.60} = \$50,000$$

In many cases it is useful to develop a graphic representation of a break-even analysis. Exhibit 2.1 provides a visual solution to the problem posed previously. The horizontal line at $30,000 represents fixed costs. The upward-sloping line beginning at $30,000 represents the total cost, which is equal to the sum of fixed plus variable costs. This line has a slope equal to $2.00—each unit increase in volume results in a $2.00 increase in the total cost. The upward-sloping line beginning at zero represents revenue and has a slope of $5.00—each unit increase in sales produces a $5.00 increase in revenue. The distance between the revenue line and the total cost line represents dollars of profit (above the break-even point) or loss (below the break-even point).

EXHIBIT 2.1

Break-Even Analysis Chart



Sensitivity Analysis

Contribution analysis can be applied in a number of different ways, depending on the manager's needs. The following illustrations show how the break-even points in our example can be varied by changing selling price, variable costs, and fixed costs.

1. What would break-even volume be if fixed costs were increased to $40,000 while the selling price and variable costs remained unchanged?

Fixed costs = $40,000
Contribution per unit = $3
Unit break-even volume = $40,000/$3 = 13,333 units
Dollar break-even volume = $40,000/0.60 = $66,667

Note that the difference between the dollar break-even volume calculated from the contribution margin and the result of simply multiplying unit selling price by unit break-even volume (13,333 × $5 = $66,665) is due to rounding.

2. What would break-even volume be if selling price were dropped from $5.00 to $4.00 while fixed and variable costs remained unchanged?

Fixed costs = $30,000
Contribution per unit = $2
Unit break-even volume = $30,000/$2 = 15,000 units
Dollar break-even volume = $30,000/0.50 = $60,000

3. Finally, what would break-even volume be if the unit variable cost per unit were reduced to $1.50, selling price remained at $5.00, and fixed costs were $30,000?

Fixed costs = $30,000
Contribution per unit = $3.50
Unit break-even volume = $30,000/$3.50 = 8,571 units
Dollar break-even volume = $30,000/0.70 = $42,857

Contribution Analysis and Profit Impact

No manager is content to operate at the break-even point in unit or dollar sales volume. Profits are necessary for the continued operation of an organization. A modified break-even analysis is used to incorporate a profit goal.

To modify the break-even formula to incorporate a dollar profit goal, we need only regard the profit goal as an additional fixed cost, as follows:

$$\text{Unit volume to achieve dollar profit goal} = \frac{\text{total dollar fixed costs + dollar profit goal}}{\text{contribution per unit}}$$

Suppose a firm has fixed costs of $200,000 budgeted for a product or service, the unit selling price is $25.00, and the unit variable costs are $10.00. How many units must be sold to achieve a dollar profit goal of $20,000?

Fixed costs + profit goal = $200,000 + $20,000 = $220,000
Contribution per unit = $25 - $10 = $15
Unit volume to achieve dollar profit goal = $220,000/$15
= 14,667 units

Many firms specify their profit goal as a percentage of sales rather than as a dollar amount ("Our profit goal is a 20 percent profit on sales"). This objective can be incorporated into the break-even formula by subtracting the profit goal from the contribution-per-unit. If the goal is to achieve a 20 percent profit on sales, each dollar of sales must "contribute" $0.20 to profit. In our example, each unit sold for $25.00 must contribute $5.00 to profit (.20 × $25.00). The break-even formula incorporating a percent profit on sales goal is as follows:

$$\text{Unit volume to achieve profit goal} = \frac{\text{total dollar fixed costs}}{\text{contribution per unit - unit profit goal}}$$

The unit volume break-even point to achieve a 20 percent profit goal is 20,000 units:

$$\begin{aligned}\text{Fixed costs} &= \$200{,}000\\ \text{Contribution per unit - unit profit goal} &= \$25 - \$10 - \$5 = \$10\\ \text{Unit volume to achieve profit goal} &= \$200{,}000/\$10\\ &= 20{,}000 \text{ units}\end{aligned}$$

Contribution Analysis and Market Size

An important consideration in contribution analysis is the relationship of break-even unit or dollar volume to market size. Consider the situation in which a manager has conducted a break-even analysis and found the unit volume break-even point to be 50,000 units. This number has meaning only when compared with the potential size of the market segment sought. If the market potential is 100,000 units, the manager's product or service must capture 50 percent of the market sought to break even. An important question to be resolved is whether such a percentage can be achieved. A manager can assess the feasibility of a venture by comparing the break-even volume with market size and market-capture percentage.

Contribution Analysis and Performance Measurement

A second application of contribution analysis lies in performance measurement. For example, a marketing manager may wish to examine the performance of products. Consider an organization with two products, X and Y. A description of each product's financial performance follows:

	Product X (10,000 volume)	*Product Y (20,000 volume)*	*Total (30,000 volume)*
Unit price	$ 10	$ 3	
Sales revenue	100,000	60,000	$160,000
Unit variable cost	4	1.50	
Total variable cost	40,000	30,000	70,000
Unit contribution	6	1.50	
Total contribution	60,000	30,000	90,000
Fixed costs	45,000	10,000	55,000
Net profit	$ 15,000	$20,000	$ 35,000

The net profit figure shows that Product Y is more profitable than Product X. Product X is four times more profitable than Product Y on a unit-contribution basis, however, and generates twice the contribution dollars to overhead. The difference in profitability comes from the allocation of fixed costs to the products. In measuring performance, it is important to consider which products contribute

most heavily to the organization's total fixed costs ($55,000 in this example) and then to total profit.

Should a manager look only at net profit, a decision might be made to drop Product X. Product Y would then have to cover total fixed costs, however. If the fixed costs remain at $55,000 and only Product Y is sold, this organization will experience a *net loss* of $25,000, assuming no change in Product Y volume.

Assessment of Cannibalization

A third application of contribution analysis is in the assessment of cannibalization effects. Cannibalization is the process by which one product or service sold by a firm gains a portion of its revenue by diverting sales from another product or service also sold by the firm. For example, sales of Brand X's new gel toothpaste may be at the expense of sales of Brand X's existing opaque white toothpaste. The problem facing a marketing manager is to assess the financial effect of cannibalization.

Consider the following data:

	Existing Opaque White Toothpaste	*New Gel Toothpaste*
Unit selling price	$1.00	$1.10
Unit variable costs	-0.20	-0.40
Unit contribution	$0.80	$0.70

The gel toothpaste can be sold at a slightly higher price, given its formulation and taste, but the variable costs are also higher. Hence, the gel toothpaste has a lower contribution per unit. Therefore, for every unit of the gel toothpaste sold instead of a unit of the opaque white toothpaste, the firm "loses" $0.10. Suppose further that the company expects to sell 1 million units of the new gel toothpaste in the first year after introduction and that, of that amount, 500,000 units will be diverted from the opaque white toothpaste, of which the company had expected to sell 1 million units. The task of the marketing manager is to determine how the introduction of the new gel toothpaste will affect Brand X's total contribution dollars.

One approach to assessing the financial impact of cannibalization is shown here:

1. Brand X expects to lose $0.10 for each unit diverted from the opaque white toothpaste to the gel toothpaste.
2. Given that 500,000 units will be cannibalized from the opaque white toothpaste, the total contribution *lost* is $50,000 ($0.10 × 500,000 units).
3. However, the new gel toothpaste will sell an additional 500,000 units at a contribution per unit of $0.70, which means that $350,000 ($0.70 × 500,000 units) in additional contribution will be generated.
4. Therefore, the net financial effect is a positive increase in contribution dollars of $300,000 ($350,000 - $50,000).

Another approach to assessing the cannibalization effect is as follows:

1. The opaque white toothpaste alone had been expected to sell 1 million units with a unit contribution of $0.80. Therefore, contribution dollars without the gel would equal $800,000 ($0.80 × 1,000,000 units).
2. The gel toothpaste is expected to sell 1 million units with a unit contribution of $0.70.
3. Given the cannibalism rate of 50 percent (that is, one-half of the gel's volume is diverted from the opaque white toothpaste), the combined contribution can be calculated as follows:

Product	*Unit Volume*	*Unit Contribution*	*Contribution Dollars*
Opaque white toothpaste	500,000	$0.80	$400,000
Gel toothpaste:			
Cannibalized volume	500,000	0.70	350,000
Incremental volume	500,000	0.70	350,000
Total	1,500,000		$1,100,000
Less original forecast volume for opaque white toothpaste	1,000,000	0.80	800,000
Total	+500,000		+$300,000

Both approaches arrive at the same conclusion: Brand X will benefit by $300.000 from the introduction of the gel toothpaste. The manager should use whichever approach he or she is more comfortable with in an analytic sense.

It should be emphasized, however, that the incremental fixed costs associated with advertising and sales promotion or any additions or changes in manufacturing capacity must be considered to complete the analysis. If the fixed costs approximate or exceed $300,000, the new product should be viewed in a very different light.

■ LIQUIDITY

Liquidity refers to an organization's ability to meet short-term (usually within a budget year) financial obligations. A key measure of an organization's liquidity position is its working capital. *Working capital* is the dollar value of an organization's *current assets* (such as cash, accounts receivable, prepaid expenses, inventory) *minus* the dollar value of *current liabilities* (such as short-term accounts payable for goods and services, income taxes).

A manager should be aware of the impact of marketing actions on working capital. Marketing expenditures precede sales volume; therefore, cash outlays for marketing efforts reduce current assets. If marketing expenditures cannot be met out of cash, accounts payable are incurred. In either case, working capital is reduced. In a positive vein, a marketing manager's creation of sales volume, with corresponding increases in net profit, contributes to working capital. Since the timing of marketing expenditures and sales volume is often lagged, a marketing manager must be wary of marketing efforts that unnecessarily deplete working capital and must assess the likelihood of potential sales, given a specified expenditure level.

■ OPERATING LEVERAGE

A financial concept closely akin to break-even analysis is operating leverage. *Operating leverage* refers to the extent to which fixed costs and variable costs are used in the production and marketing of products and services. Firms that have high total fixed costs relative to total variable costs are defined as having high operating leverage. Examples of firms with high operating leverage include airlines and heavy-equipment manufacturers. Firms with low total fixed costs relative to total variable costs are defined as having low operating leverage. Firms typically having low operating leverage include residential contractors and wholesale distributors.

The higher a firm's operating leverage, the faster its total profits will increase once sales exceed break-even volume. By the same token, however, those firms with

EXHIBIT 2.2

Effect of Operating Leverage on Profit

	Base Case		*10% Increase in Sales*		*10% Decrease in Sales*	
	High-Fixed-Cost Firm	*High-Variable-Cost Firm*	*High-Fixed-Cost Firm*	*High-Variable-Cost Firm*	*High-Fixed-Cost Firm*	*High-Variable-Cost Firm*
Sales	$100,000	$100,000	$110,000	$110,000	$90,000	$90,000
Variable costs	20,000	80,000	22,000	88,000	18,000	72,000
Fixed costs	80,000	20,000	80,000	20,000	80,000	20,000
Profit	$0	$0	$8,000	$2,000	($8,000)	($2,000)

high operating leverage will incur losses at a faster rate once sales volume falls below the break-even point.

Exhibit 2.2 illustrates the effect of operating leverage on profit. The base case shows two firms that have identical break-even sales volumes. The cost structures of the two firms differ, however, with one having high fixed and low variable costs and the other having low fixed and high variable costs. Note that when sales volume is increased 10 percent, the firm with high fixed and low variable costs achieves a much higher profit than the firm with low fixed and high variable costs. When sales volume declines, however, just the opposite is true. That is, the firm with high fixed and low variable costs incurs losses at a faster rate than the firm with high variable and low fixed costs once sales fall below the break-even point.

The message of operating leverage should be clear from this example. Firms with high operating leverage benefit more from sales gains than do firms with low operating leverage. At the same time, firms with high operating leverage are more sensitive to sales-volume declines, since losses will be incurred at a faster rate. Knowledge of a firm's cost structure will, therefore, prove valuable in assessing the gains and losses from changes in sales volume brought about by marketing efforts.

■ DISCOUNTED CASH FLOW

Another useful concept from finance is discounted cash flow. Discounted cash flow incorporates the theory of the time value of money, or present-value analysis. The idea behind the present value of money is that a dollar received next year is not equivalent to a dollar received today because the use of money has a value reflected by risk, inflation, and opportunity cost. To illustrate, if $500 can be invested today at 10 percent, $550 will be received a year later ($500 + 10% of $500). In other words, $550 to be received next year has a present value of $500 if 10 percent can be earned ($550/1.10 = $500). Following this line of reasoning, the estimated results of an investment (e.g., a business) can be stated as a cash equivalent at the present time (i.e., its present value). *Discounted cash flows* are future cash flows expressed in terms of their present value.

The discounted cash flow technique employs this reasoning by evaluating the present value of a business's net *cash flow* (cash inflows minus cash outflows). A simplified view of cash flow is "cash flow from operations," which is net income plus depreciation charges, because depreciation is a noncash charge against sales to determine net income. The present value of a stream of cash flows is obtained by selecting an interest or discount rate at which these flows are to be valued, or discounted, and the timing of

each. The interest or discount rate is often defined by the opportunity *cost of capital*—the cost of earnings opportunities forgone by investing in a business with its attendant risk as opposed to investing in risk-free securities such as U.S. Treasury bills.

A simple application of discounted cash flow analysis illustrates the mechanics involved. Suppose, for example, that a firm is considering investing $105,000 in one of two businesses. The firm has forecast cash flows for each business over the next five years. The discount rate adopted by the firm is 15 percent. Given the discount rate of 15 percent, the cash flow when the investment is made is a negative $105,000 (no cash inflows, only outflows). The first-year cash flow for Business A is discounted by the factor $1/(1 + 0.15)^1$, or $\$25,000 \times 0.879 = \$21,700$. The second-year cash flow for Business A is discounted by the factor $1/(1 + 0.15)^2$, or $\$35,000 \times 0.756 = \$26,460$, and so forth. Exhibit 2.3 shows the complete analysis for Businesses A and B for the five-year planning horizon.

Three points are of particular interest. First, an important series of numbers is the *cumulative cash flow*. This series shows that the cumulative cash flows from Business B are greater than from Business A. Second, the *payback period* is two years for Business B, as opposed to about three years for Business A. In other words, Business B will recover its investment sooner than will Business A. Finally, the discounted cash flows incorporating the time value of money are clearly indicated. Business A will produce a higher cash flow in later years than will Business B. However, the present value of these cash flows, when discounted, is less than the value of the cash flows that Business B will produce.

From a decision-making perspective, both businesses produce a positive net present value. This is important given the decision rule when interpreting net present value: An investment should be accepted if the net present value is positive and rejected if it is negative. In which business should the firm invest its capital? Assuming that the firm wishes to create value for its shareholders, the option with the higher net present value (Business B) is preferred.

A valuable characteristic of present-value analysis is that the discount factors and discounted cash are additive. If the projected cash flows from an investment are equal over a specified time period, summing the discount factors for each of the time periods (say three years) and multiplying this figure by the annual cash flow estimate will give the present value.

EXHIBIT 2.3

Application of Discounted Cash Flow Analysis with a 15 Percent Discount Factor

		Business A			*Business B*		
Year	*Discount Factor*	*Cash Flow*	*Cumulative Cash Flow*	*Discounted Cash Flow*	*Cash Flow*	*Cumulative Cash Flow*	*Discounted Cash Flow*
0	1.000	($105,000)	($105,000)	($105,000)	($105,000)	($105,000)	($105,000)
1	0.870	25,000	(80,000)	21,750	50,000	(55,000)	43,500
2	0.756	35,000	(45,000)	26,460	55,000	0	41,580
3	0.658	50,000	5,000	32,900	60,000	60,000	39,480
4	0.572	70,000	75,000	40,040	65,000	125,000	37,180
5	0.497	90,000	165,000	44,730	70,000	195,000	34,790
Totals				$ 60,880			$ 91,530

Suppose, for example, that a firm can expect a constant cash flow of $10 million per year for three years, and the discount rate is 15 percent. The present value of this cash flow can be computed as follows (in millions of dollars):

$0.870 \times \$10 = \$8.70$
$0.756 \times \$10 = \$7.56$
$0.658 \times \$10 = \$6.58$
$2.284 \times \$10 = \$22.84$

Any basic finance textbook covers discounted cash flow in depth and should be consulted for further study. As a word of caution, the application of discounted cash flow analysis is deceptively simple. Determining appropriate discount rates and projecting future cash flows is not an easy task. Conservative estimates and the use of several "what if" scenarios will ensure that the discounted cash flow technique will highlight investment opportunities that create value for the firm and its shareholders.

■ PREPARING A PRO FORMA INCOME STATEMENT

Because marketing managers are accountable for the profit impact of their actions, they must translate their strategies and tactics into *pro forma*, or projected, income statements. A *pro forma* income statement displays projected revenues, budgeted expenses, and estimated net profit for an organization, product, or service during a specific planning period, usually a year. *Pro forma* income statements include a sales forecast and a listing of variable and fixed costs that can be programmed or committed.

Pro forma income statements can be prepared in different ways and reflect varying levels of specificity. Exhibit 2.4 shows a typical layout for a *pro forma* income statement consisting of six major categories or line items:

EXHIBIT 2.4

Pro Forma Income Statement for the 12-Month Period Ended December 31, 2002

Sales		$1,000,000
Cost of goods sold		500,000
Gross margin		$500,000
Marketing expenses		
Sales expenses	$170,000	
Advertising expenses	90,000	
Freight or delivery expenses	40,000	300,000
General and administrative expenses		
Administrative salaries	$120,000	
Depreciation on buildings and equipment	20,000	
Interest expense	5,000	
Property taxes and insurance	5,000	
Other administrative expenses	5,000	155,000
Net profit before (income) tax		$45,000

1. *Sales*—forecasted unit volume times unit selling price.
2. *Cost of goods sold*—costs incurred in buying or producing products and services. Generally speaking, these costs are constant per unit within certain volume ranges and vary with total unit volume.
3. *Gross margin* (sometimes called *gross profit*)—represents the remainder after cost of goods sold has been subtracted from sales.
4. *Marketing expenses*—generally, programmed expenses budgeted to produce sales. Advertising expenses are typically fixed. Sales expenses can be fixed, such as a salesperson's salary, or variable, such as sales commissions. Freight or delivery expenses are typically constant per unit and vary with total unit volume.
5. *General and administrative expenses*—generally, committed fixed costs for the planning period, which cannot be avoided if the organization is to operate. These costs are frequently called overhead.
6. *Net income before (income) taxes* (often called *net profit before taxes*)—the remainder after all costs have been subtracted from sales.

A *pro forma* income statement reflects a marketing manager's expectations (sales) given certain inputs (costs). This means that a manager must think specifically about customer response to strategies and tactics and focus attention on the organization's financial objectives of profitability and growth when preparing a *pro forma* income statement.

■ SUMMARY

This chapter provides an overview of basic accounting and financial concepts. A word of caution is necessary, however. Financial analysis of marketing actions is a necessary but insufficient criterion for justifying marketing programs. A careful analysis of other variables impinging on the decision at hand is required. Thus, judgment enters the picture. "Numbers" serve only to complement general marketing analysis skills and are not an end in themselves. In this regard, it is wise to consider some words of Albert Einstein: "Not everything that counts can be counted, and not everything that can be counted counts."

■ EXERCISES

1. Executives of Studio Recordings, Inc., produced the latest compact disc by the Starshine Sisters Band, titled *Sunshine/Moonshine*. The following cost information pertains to the new CD:

CD package and disc (direct material and labor)	$1.25/CD
Songwriters' royalties	$0.35/CD
Recording artists' royalties	$1.00/CD
Advertising and promotion	$275,000
Studio Recordings, Inc., overhead	$250,000
Selling price to CD distributor	$9.00

Calculate the following:

   a. Contribution per CD unit
   b. Break-even volume in CD units and dollars

c. Net profit if 1 million CDs are sold

d. Necessary CD unit volume to achieve a $200,000 profit

2. Video Concepts, Inc. (VCI) markets video equipment and film through a variety of retail outlets. Presently, VCI is faced with a decision as to whether it should obtain the distribution rights to an unreleased film titled *Touch of Orange*. If this film is distributed by VCI directly to large retailers, VCI's investment in the project would be $150,000. VCI estimates the total market for the film to be 100,000 units. Other data available are as follows:

Cost of distribution rights for film	$125,000
Label design	5,000
Package design	10,000
Advertising	35,000
Reproduction of copies (per 1,000)	4,000
Manufacture of labels and packaging (per 1,000)	500
Royalties (per 1,000)	500

VCI's suggested retail price for the film is $20 per unit. The retailer's margin is 40 percent.

a. What is VCI's unit contribution and contribution margin?

b. What is the break-even point in units? In dollars?

c. What share of the market would the film have to achieve to earn a 20 percent return on VCI's investment the first year?

3. The group product manager for ointments at American Therapeutic Corporation was reviewing price and promotion alternatives for two products: Rash-Away and Red-Away. Both products were designed to reduce skin irritation, but Red-Away was primarily a cosmetic treatment whereas Rash-Away also included a compound that eliminated the rash.

The price and promotion alternatives recommended for the two products by their respective brand managers included the possibility of using additional promotion or a price reduction to stimulate sales volume. A volume, price, and cost summary for the two products follows:

	Rash-Away	*Red-Away*
Unit price	$2.00	$1.00
Unit variable costs	1.40	0.25
Unit contribution	$0.60	$0.75
Unit volume	1,000,000 units	1,500,000 units

Both brand managers included a recommendation to either reduce price by 10 percent or invest an incremental $150,000 in advertising.

a. What absolute increase in unit sales and dollar sales will be necessary to recoup the incremental increase in advertising expenditures for Rash-Away? For Red-Away?

b. How many additional sales dollars must be produced to cover each $1.00 of incremental advertising for Rash-Away? For Red-Away?

c. What absolute increase in unit sales and dollar sales will be necessary to maintain the level of total contribution dollars if the price of each product is reduced by 10 percent?

4. After spending $300,000 for research and development, chemists at Diversified Citrus Industries have developed a new breakfast drink. The drink, called Zap,

will provide the consumer with twice the amount of vitamin C currently available in breakfast drinks. Zap will be packaged in an eight-ounce can and will be introduced to the breakfast drink market, which is estimated to be equivalent to 21 million eight-ounce cans nationally.

One major management concern is the lack of funds available for marketing. Accordingly, management has decided to use newspapers (rather than television) to promote Zap in the introductory year and distribute Zap in major metropolitan areas that account for 65 percent of U.S. breakfast drink volume. Newspaper advertising will carry a coupon that will entitle the consumer to receive $0.20 off the price of the first can purchased. The retailer will receive the regular margin and be reimbursed for redeemed coupons by Diversified Citrus Industries. Past experience indicates that for every five cans sold during the introductory year, one coupon will be returned. The cost of the newspaper advertising campaign (excluding coupon returns) will be $250,000. Other fixed overhead costs are expected to be $90,000 per year.

Management has decided that the suggested retail price to the consumer for the eight-ounce can will be $0.50. The only unit variable costs for the product are $0.18 for materials and $0.06 for labor. The company intends to give retailers a margin of 20 percent off the suggested retail price and wholesalers a margin of 10 percent of the retailers' cost of the item.

a. At what price will Diversified Citrus Industries be selling its product to wholesalers?

b. What is the contribution per unit for Zap?

c. What is the break-even unit volume in the first year?

d. What is the first-year break-even share of market?

5. Video Concepts, Inc. (VCI) manufactures a line of videocassette recorders (VCRs) that are distributed to large retailers. The line consists of three models of VCRs. The following data are available regarding the models:

Model	*VCR Selling Price per Unit*	*Variable Cost per Unit*	*Demand/Year (units)*
Model LX1	$175	$100	2,000
Model LX2	250	125	1,000
Model LX3	300	140	500

VCI is considering the addition of a fourth model to its line of VCRs. This model would be sold to retailers for $375. The variable cost of this unit is $225. The demand for the new Model LX4 is estimated to be 300 units per year. Sixty percent of these unit sales of the new model is expected to come from other models already being manufactured by VCI (10 percent from Model LX1, 30 percent from Model LX2, and 60 percent from Model LX3). VCI will incur a fixed cost of $20,000 to add the new model to the line. Based on the preceding data, should VCI add the new Model LX4 to its line of VCRs? Why?

6. Max Leonard, vice president of Marketing for Dysk Computer, Inc., must decide whether to introduce a midpriced version of the firm's DC6900 personal computer product line—the DC6900-X. The DC6900-X would sell for $3,900, with unit variable costs of $1,800. Projections made by an independent marketing research firm indicate that the DC6900-X would achieve a sales volume of 500,000 units next year, in its first year of commercialization. One-half of the first year's volume would come from competitors' personal computers and market growth. However, a consumer research study indicates that 30 percent of the DC6900-X sales volume would come from the higher-priced

DC6900-Omega personal computer, which sells for $5,900 (with unit variable costs of $2,200). Another 20 percent of the DC6900-X sales volume would come from the economy-priced DC6900-Alpha personal computer, priced at $2,500 (with unit variable costs of $1,200). The DC6900-Omega unit volume is expected to be 400,000 units next year, and the DC6900-Alpha is expected to achieve a 600,000-unit sales level. The fixed costs of launching the DC6900-X have been forecast to be $2 million during the first year of commercialization. Should Mr. Leonard add the DC6900-X model to the line of personal computers? Why?

7. A sports nutrition company is examining whether a new high-performance sports drink should be added to its product line. A preliminary feasibility analysis indicated that the company would need to invest $17.5 million in a new manufacturing facility to produce and package the product. A financial analysis using sales and cost data supplied by marketing and production personnel indicated that the net cash flow (cash inflows minus cash outflows) would be $6.1 million in the first year of commercialization, $7.4 million in year 2, $7.0 million in year 3, and $5.5 million in year 4.

   Senior company executives were undecided whether to move forward with the development of the new product. They requested that a discounted cash flow analysis be performed using two different discount rates: 20 percent and 15 percent.

   a. Should the company proceed with development of the product if the discount rate is 20 percent? Why?

   b. Does the decision to proceed with development of the product change if the discount rate is 15 percent? Why?

8. The annual planning process at Century Office Systems, Inc. had been arduous but produced a number of important marketing initiatives for the next year. Most notably, company executives had decided to restructure its product-marketing team into two separate groups: (1) Corporate Office Systems and (2) Home Office Systems. Angela Blake was assigned responsibility for the Home Office Systems group, which would market the company's word-processing hardware and software for home and office-at-home use by individuals. Her marketing plan, which included a sales forecast for next year of $25 million, was the result of a detailed market analysis and negotiations with individuals both inside and outside the company. Discussions with the sales director indicated that 40 percent of the company sales force would be dedicated to selling products of the Home Office Systems group. Sales representatives would receive a 15 percent commission on sales of home office systems. Under the new organizational structure, the Home Office Systems group would be charged with 40 percent of the budgeted sales force expenditure. The sales director's budget for salaries and fringe benefits of the sales force and non-commission selling costs for both the Corporate and Home Office Systems groups was $7.5 million.

   The advertising and promotion budget contained three elements: trade magazine advertising, cooperative newspaper advertising with Century Office Systems, Inc. dealers, and sales promotion materials including product brochures, technical manuals, catalogs, and point-of-purchase displays. Trade magazine ads and sales promotion materials were to be developed by the company's advertising and public relations agency. Production and media placement costs were budgeted at $300,000. Cooperative advertising copy for both newspaper and radio use had budgeted production costs of $100,000. Century Office Systems, Inc.'s cooperative advertising allowance policy stated

that the company would allocate 5 percent of company sales to dealers to promote its office systems. Dealers always used their complete cooperative advertising allowances.

Meetings with manufacturing and operations personnel indicated that the direct costs of material and labor and direct factory overhead to produce the Home Office System product line represented 50 percent of sales. The accounting department would assign $600,000 in indirect manufacturing overhead (for example, depreciation, maintenance) to the product line and $300,000 for administrative overhead (clerical, telephone, office space, and so forth). Freight for the product line would average 8 percent of sales.

Blake's staff consisted of two product managers and a marketing assistant. Salaries and fringe benefits for Ms. Blake and her staff were $250,000 per year.

a. Prepare a *pro forma* income statement for the Home Office Systems group given the information provided.

b. Prepare a *pro forma* income statement for the Home Office Systems group given annual sales of only $20 million.

c. At what level of dollar sales will the Home Office Systems group break even?