

Marketing by the Numbers

Marketing managers are facing increased accountability for the financial implications of their actions. This appendix provides a basic introduction to measuring marketing financial performance. Such financial analysis guides marketers in making sound marketing decisions and in assessing the outcomes of those decisions.

The appendix is built around a hypothetical manufacturer of consumer electronics products—ConnectPhone. In the past, ConnectPhone has concentrated on making Internet modems. However, the company is now introducing a new type of product—a *media phone* that replaces a household's telephone and provides "always-on" Internet connectivity and wireless phone access through VoIP (Voice over Internet Protocol) technology. In this appendix, we will analyze the various decisions ConnectPhone's marketing managers must make before and after the new-product launch.

The appendix is organized into *three sections*. The *first section* introduces pricing, break-even, and margin analysis assessments that will guide the introduction of ConnectPhone's new product. The *second section* discusses demand estimates, the marketing budget, and marketing performance measures. It begins with a discussion of estimating market potential and company sales. It then introduces the marketing budget, as illustrated through a *pro forma* profit-and-loss statement followed by the actual profit-and-loss statement. Next, we discuss marketing performance measures, with a focus on helping marketing managers to better defend their decisions from a financial perspective. In the *third section*, we analyze the financial implications of various marketing tactics.

Each of the three sections ends with a set of quantitative exercises that provide you with an opportunity to apply the concepts you learned to situations beyond ConnectPhone.

Pricing, Break-Even, and Margin Analysis (pp A11–A16)

Pricing Considerations

Determining price is one of the most important marketing-mix decisions. The limiting factors are demand and costs. Demand factors, such as buyer-perceived value, set the price ceiling. The company's costs set the price floor. In between these two factors, marketers must consider competitors' prices and other factors such as reseller requirements, government regulations, and company objectives.

Current competing media phone products sell at retail prices between \$500 and \$1,000. ConnectPhone plans to introduce its new product at a lower price in order to expand the market and to gain market share rapidly. We first consider ConnectPhone's pricing decision from a cost perspective. Then, we consider consumer value, the competitive environment, and reseller requirements.

Determining Costs

Recall from Chapter 10 that there are different types of costs. **Fixed costs** do not vary with production or sales level and include costs such as rent, interest, depreciation, and clerical and management salaries. Regardless of the level of output, the company must pay these

Fixed costs

Costs that do not vary with production or sales level.

Variable costs

Costs that vary directly with the level of production.

Total costs

The sum of the fixed and variable costs for any given level of production.

Cost-plus pricing (or markup pricing)

A standard markup to the cost of the product.

Relevant costs

Costs that will occur in the future and that will vary across the alternatives being considered.

Break-even price

The price at which total revenue equals total cost and profit is zero.

Return on investment (ROI) pricing (or target-return pricing)

A cost-based pricing method that determines price based on a specified rate of return on investment.

costs. Whereas total fixed costs remain constant as output increases, the fixed cost per unit (or average fixed cost) will decrease as output increases because the total fixed costs are spread across more units of output. **Variable costs** vary directly with the level of production and include costs related to the direct production of the product (such as costs of goods sold—COGS) and many of the marketing costs associated with selling it. Although these costs tend to be uniform for each unit produced, they are called variable because their total varies with the number of units produced. **Total costs** are the sum of the fixed and variable costs for any given level of production.

ConnectPhone has invested \$10 million in refurbishing an existing facility to manufacture the new media phone product. Once production begins, the company estimates that it will incur fixed costs of \$20 million per year. The variable cost to produce each device is estimated to be \$250 and is expected to remain at that level for the output capacity of the facility.

Setting Price Based on Costs

ConnectPhone starts with the cost-based approach to pricing discussed in Chapter 10. Recall that the simplest method, **cost-plus pricing** (or **markup pricing**), simply adds a standard markup to the cost of the product. To use this method, however, ConnectPhone must specify expected unit sales so that total unit costs can be determined. Unit variable costs will remain constant regardless of the output, but *average unit fixed costs* will decrease as output increases.

To illustrate this method, suppose ConnectPhone has fixed costs of \$20 million, variable costs of \$250 per unit, and expects unit sales of one million media phones. Thus, the cost per unit is given by:

$$\text{Unit cost} = \text{variable cost} + \frac{\text{fixed costs}}{\text{unit sales}} = \$250 + \frac{\$20,000,000}{1,000,000} = \$270$$

Note that we do *not* include the initial investment of \$10 million in the total fixed cost figure. It is not considered a fixed cost because it is not a *relevant* cost. **Relevant costs** are those that will occur in the future and that will vary across the alternatives being considered. ConnectPhone's investment to refurbish the manufacturing facility was a one-time cost that will not reoccur in the future. Such past costs are *sunk costs* and should not be considered in future analyses.

Also notice that if ConnectPhone sells its product for \$270, the price is equal to the total cost per unit. This is the **break-even price**—the price at which unit revenue (price) equals unit cost and profit is zero.

Suppose ConnectPhone does not want to merely break even but rather wants to earn a 25 percent markup on sales. ConnectPhone's markup price is:¹

$$\text{Markup price} = \frac{\text{unit cost}}{(1 - \text{desired return on sales})} = \frac{\$270}{1 - .25} = \$360$$

This is the price at which ConnectPhone would sell the product to resellers such as wholesalers or retailers to earn a 25 percent profit on sales.

Another approach ConnectPhone could use is called **return on investment (ROI) pricing** (or **target-return pricing**). In this case, the company *would* consider the initial \$10 million investment, but only to determine the dollar profit goal. Suppose the company wants a 30 percent return on its investment. The price necessary to satisfy this requirement can be determined by:

$$\text{ROI price} = \text{unit cost} + \frac{\text{ROI} \times \text{investment}}{\text{unit sales}} = \$270 + \frac{0.3 \times \$10,000,000}{1,000,000} = \$273$$

That is, if ConnectPhone sells its product for \$273, it will realize a 30 percent return on its initial investment of \$10 million.

In these pricing calculations, unit cost is a function of the expected sales, which were estimated to be one million units. But what if actual sales were lower? Then the unit cost

would be higher because the fixed costs would be spread over fewer units, and the realized percentage markup on sales or ROI would be lower. Alternatively, if sales are higher than the estimated one million units, unit cost would be lower than \$270, so a lower price would produce the desired markup on sales or ROI. It's important to note that these cost-based pricing methods are *internally* focused and do not consider demand, competitors' prices, or reseller requirements. Because ConnectPhone will be selling this product to consumers through wholesalers and retailers offering competing brands, the company must consider markup pricing from this perspective.

Setting Price Based on External Factors

Whereas costs determine the price floor, ConnectPhone also must consider external factors when setting price. ConnectPhone does not have the final say concerning the final price of its media phones to consumers—retailers do. So it must start with its suggested retail price and work back. In doing so, ConnectPhone must consider the markups required by resellers that sell the product to consumers.

In general, a dollar **markup** is the difference between a company's selling price for a product and its cost to manufacture or purchase it. For a retailer, then, the markup is the difference between the price it charges consumers and the cost the retailer must pay for the product. Thus, for any level of reseller:

$$\text{Dollar markup} = \text{selling price} - \text{cost}$$

Markups are usually expressed as a percentage, and there are two different ways to compute markups—on *cost* or on *selling price*:

$$\text{Markup percentage on cost} = \frac{\text{dollar markup}}{\text{cost}}$$

$$\text{Markup percentage on selling price} = \frac{\text{dollar markup}}{\text{selling price}}$$

To apply reseller margin analysis, ConnectPhone must first set the suggested retail price and then work back to the price at which it must sell the product to a wholesaler. Suppose retailers expect a 30 percent margin and wholesalers want a 20 percent margin based on their respective selling prices. And suppose that ConnectPhone sets a manufacturer's suggested retail price (MSRP) of \$599.99 for its product.

Recall that ConnectPhone wants to expand the market by pricing low and generating market share quickly. ConnectPhone selected the \$599.99 MSRP because it is lower than most competitors' prices, which can be as high as \$1,000. And the company's research shows that it is below the threshold at which more consumers are willing to purchase the product. By using buyers' perceptions of value and not the seller's cost to determine the MSRP, ConnectPhone is using **value-based pricing**. For simplicity, we will use an MSRP of \$600 in further analyses.

To determine the price ConnectPhone will charge wholesalers, we must first subtract the retailer's margin from the retail price to determine the retailer's cost ($\$600 - (\$600 \times 0.30) = \$420$). The retailer's cost is the wholesaler's price, so ConnectPhone next subtracts the wholesaler's margin ($\$420 - (\$420 \times 0.20) = \$336$). Thus, the **markup chain** representing the sequence of markups used by firms at each level in a channel for ConnectPhone's new product is:

Suggested retail price:	\$600
minus retail margin (30%):	– \$180
Retailer's cost/wholesaler's price:	\$420
minus wholesaler's margin (20%):	– \$84
Wholesaler's cost/ConnectPhone's price:	\$336

By deducting the markups for each level in the markup chain, ConnectPhone arrives at a price for the product to wholesalers of \$336.

Markup

The difference between a company's selling price for a product and its cost to manufacture or purchase it.

Value-based pricing

Offering just the right combination of quality and good service at a fair price.

Markup chain

The sequence of markups used by firms at each level in a channel.

Break-Even and Margin Analysis

The previous analyses derived a value-based price of \$336 for ConnectPhone's product. Although this price is higher than the break-even price of \$270 and covers costs, that price assumed a demand of 1 million units. But how many units and what level of dollar sales must ConnectPhone achieve to break even at the \$336 price? And what level of sales must be achieved to realize various profit goals? These questions can be answered through break-even and margin analysis.

Determining Break-Even Unit Volume and Dollar Sales

Based on an understanding of costs, consumer value, the competitive environment, and reseller requirements, ConnectPhone has decided to set its price to wholesalers at \$336. At that price, what sales level will be needed for ConnectPhone to break even or make a profit on its media phones? **Break-even analysis** determines the unit volume and dollar sales needed to be profitable given a particular price and cost structure. At the break-even point, total revenue equals total costs and profit is zero. Above this point, the company will make a profit; below it, the company will lose money. ConnectPhone can calculate break-even volume using the following formula:

$$\text{Break-even volume} = \frac{\text{fixed costs}}{\text{price} - \text{unit variable cost}}$$

The denominator (price – unit variable cost) is called **unit contribution** (sometimes called contribution margin). It represents the amount that each unit contributes to covering fixed costs. Break-even volume represents the level of output at which all (variable and fixed) costs are covered. In ConnectPhone's case, break-even unit volume is:

$$\text{Break-even volume} = \frac{\text{fixed cost}}{\text{price} - \text{variable cost}} = \frac{\$20,000,000}{\$336 - \$250} = 232,558.1 \text{ units}$$

Thus, at the given cost and pricing structure, ConnectPhone will break even at 232,559 units.

To determine the break-even dollar sales, simply multiply unit break-even volume by the selling price:

$$\text{BE sales} = \text{BE}_{\text{vol}} \times \text{price} = 232,559 \times \$336 = \$78,139,824$$

Another way to calculate dollar break-even sales is to use the percentage contribution margin (hereafter referred to as **contribution margin**), which is the unit contribution divided by the selling price:

$$\text{Contribution margin} = \frac{\text{price} - \text{variable cost}}{\text{price}} = \frac{\$336 - \$250}{\$336} = 0.256 \text{ or } 25.6\%$$

Then,

$$\text{Break-even sales} = \frac{\text{fixed costs}}{\text{contribution margin}} = \frac{\$20,000,000}{0.256} = \$78,125,000$$

Note that the difference between the two break-even sales calculations is due to rounding.

Such break-even analysis helps ConnectPhone by showing the unit volume needed to cover costs. If production capacity cannot attain this level of output, then the company should not launch this product. However, the unit break-even volume is well within ConnectPhone's capacity. Of course, the bigger question concerns whether ConnectPhone can sell this volume at the \$336 price. We'll address that issue a little later.

Understanding contribution margin is useful in other types of analyses as well, particularly if unit prices and unit variable costs are unknown or if a company (say, a retailer) sells many products at different prices and knows the percentage of total sales variable costs represent. Whereas unit contribution is the difference between unit price and unit variable costs, total contribution is the difference between total sales and total variable costs. The overall contribution margin can be calculated by:

$$\text{Contribution margin} = \frac{\text{total sales} - \text{total variable costs}}{\text{total sales}}$$

Break-even analysis

Analysis to determine the unit volume and dollar sales needed to be profitable given a particular price and cost structure.

Unit contribution

The amount that each unit contributes to covering fixed costs—the difference between price and variable costs.

Contribution margin

The unit contribution divided by the selling price.

Regardless of the actual level of sales, if the company knows what percentage of sales is represented by variable costs, it can calculate contribution margin. For example, ConnectPhone's unit variable cost is \$250, or 74 percent of the selling price ($\$250 \div \$336 = 0.74$). That means for every \$1 of sales revenue for ConnectPhone, \$0.74 represents variable costs, and the difference (\$0.26) represents contribution to fixed costs. But even if the company doesn't know its unit price and unit variable cost, it can calculate the contribution margin from total sales and total variable costs or from knowledge of the total cost structure. It can set total sales equal to 100 percent regardless of the actual absolute amount and determine the contribution margin:

$$\text{Contribution margin} = \frac{100\% - 74\%}{100\%} = \frac{1 - 0.74}{1} = 1 - 0.74 = 0.26 \text{ or } 26\%$$

Note that this matches the percentage calculated from the unit price and unit variable cost information. This alternative calculation will be very useful later when analyzing various marketing decisions.

Determining "Breakeven" for Profit Goals

Although it is useful to know the break-even point, most companies are more interested in making a profit. Assume ConnectPhone would like to realize a \$5 million profit in the first year. How many must it sell at the \$336 price to cover fixed costs and produce this profit? To determine this, ConnectPhone can simply add the profit figure to fixed costs and again divide by the unit contribution to determine unit sales:

$$\text{Unit volume} = \frac{\text{fixed cost} - \text{profit goal}}{\text{price} - \text{variable cost}} = \frac{\$20,000,000 + \$5,000,000}{\$336 - \$250} = 290,697.7 \text{ units}$$

Thus, to earn a \$5 million profit, ConnectPhone must sell 290,698 units. Multiply by price to determine dollar sales needed to achieve a \$5 million profit:

$$\text{Dollar sales} = 290,698 \text{ units} \times \$336 = \$97,674,528$$

Or use the contribution margin:

$$\text{Sales} = \frac{\text{fixed cost} + \text{profit goal}}{\text{contribution margin}} = \frac{\$20,000,000 + \$5,000,000}{0.256} = \$97,656,250$$

Again, note that the difference between the two break-even sales calculations is due to rounding.

As we saw previously, a profit goal can also be stated as a return on investment goal. For example, recall that ConnectPhone wants a 30 percent return on its \$10 million investment. Thus, its absolute profit goal is \$3 million ($\$10,000,000 \times 0.30$). This profit goal is treated the same way as in the previous example:²

$$\text{Unit volume} = \frac{\text{fixed cost} + \text{profit goal}}{\text{price} - \text{variable cost}} = \frac{\$20,000,000 + \$3,000,000}{\$336 - \$250} = 267,442 \text{ units}$$

$$\text{Dollar sales} = 267,442 \text{ units} \times \$336 = \$89,860,512$$

Or

$$\text{Dollar sales} = \frac{\text{fixed cost} + \text{profit goal}}{\text{contribution margin}} = \frac{\$20,000,000 + \$3,000,000}{0.256} = \$89,843,750$$

Finally, ConnectPhone can express its profit goal as a percentage of sales, which we also saw in previous pricing analyses. Assume ConnectPhone desires a 25 percent return on sales. To determine the unit and sales volume necessary to achieve this goal, the calculation is a little different from the previous two examples. In this case, we incorporate the profit goal into the unit contribution as an additional variable cost. Look at it this way: If 25 percent of each sale must go toward profits, that leaves only 75 percent of the selling price to cover fixed costs. Thus, the equation becomes:

$$\text{Unit volume} = \frac{\text{fixed cost}}{\text{price} - \text{variable cost} - (0.25 \times \text{price})} \text{ or } \frac{\text{fixed cost}}{(0.75 \times \text{price}) - \text{variable cost}}$$

So,

$$\text{Unit volume} = \frac{\$20,000,000}{(0.75 \times \$336) - \$250} = 10,000,000 \text{ units}$$

$$\text{Dollar sales necessary} = 10,000,000 \text{ units} \times \$336 = \$3,360,000,000$$

Thus, ConnectPhone would need more than \$3 billion in sales to realize a 25 percent return on sales given its current price and cost structure! Could it possibly achieve this level of sales? The major point is this: Although break-even analysis can be useful in determining the level of sales needed to cover costs or to achieve a stated profit goal, it does not tell the company whether it is *possible* to achieve that level of sales at the specified price. To address this issue, ConnectPhone needs to estimate demand for this product.

Before moving on, however, let's stop here and practice applying the concepts covered so far. Now that you have seen pricing and break-even concepts in action as they related to ConnectPhone's new product, here are several exercises for you to apply what you have learned in other contexts.

Marketing by the Numbers Exercise Set One

Now that you've studied pricing, break-even, and margin analysis as they relate to ConnectPhone's new-product launch, use the following exercises to apply these concepts in other contexts.

- 1.1 Sanborn, a manufacturer of electric roof vents, realizes a cost of \$55 for every unit it produces. Its total fixed costs equal \$2 million. If the company manufactures 500,000 units, compute the following:
 - a. unit cost
 - b. markup price if the company desires a 10 percent return on sales
 - c. ROI price if the company desires a 25 percent return on an investment of \$1 million
- 1.2 An interior decorator purchases items to sell in her store. She purchases a lamp for \$125 and sells it for \$225. Determine the following:
 - a. dollar markup
 - b. markup percentage on cost
 - c. markup percentage on selling price
- 1.3 A consumer purchases a toaster from a retailer for \$60. The retailer's markup is 20 percent, and the wholesaler's markup is 15 percent, both based on selling price. For what price does the manufacturer sell the product to the wholesaler?
- 1.4 A vacuum manufacturer has a unit cost of \$50 and wishes to achieve a margin of 30 percent based on selling price. If the manufacturer sells directly to a retailer who then adds a set margin of 40 percent based on selling price, determine the retail price charged to consumers.
- 1.5 Advanced Electronics manufactures DVDs and sells them directly to retailers who typically sell them for \$20. Retailers take a 40 percent margin based on the retail selling price. Advanced's cost information is as follows:

DVD package and disc	\$2.50/DVD
Royalties	\$2.25/DVD
Advertising and promotion	\$500,000
Overhead	\$200,000

Calculate the following:

- a. contribution per unit and contribution margin
- b. break-even volume in DVD units and dollars
- c. volume in DVD units and dollar sales necessary if Advanced's profit goal is 20 percent profit on sales
- d. net profit if 5 million DVDs are sold

Demand Estimates, the Marketing Budget, and Marketing Performance Measures (pp A17–A18)

Market Potential and Sales Estimates

ConnectPhone has now calculated the sales needed to break even and to attain various profit goals on its new product. However, the company needs more information regarding demand in order to assess the feasibility of attaining the needed sales levels. This information is also needed for production and other decisions. For example, production schedules need to be developed and marketing tactics need to be planned.

The **total market demand** for a product or service is the total volume that would be bought by a defined consumer group in a defined geographic area in a defined time period in a defined marketing environment under a defined level and mix of industry marketing effort. Total market demand is not a fixed number but a function of the stated conditions. For example, next year's total market demand for media phones will depend on how much other producers spend on marketing their brands. It also depends on many environmental factors, such as government regulations, economic conditions, and the level of consumer confidence in a given market. The upper limit of market demand is called **market potential**.

One general but practical method that ConnectPhone might use for estimating total market demand uses three variables: (1) the number of prospective buyers, (2) the quantity purchased by an average buyer per year, and (3) the price of an average unit. Using these numbers, ConnectPhone can estimate total market demand as follows:

$$Q = n \times q \times p$$

where

Q = total market demand

n = number of buyers in the market

q = quantity purchased by an average buyer per year

p = price of an average unit

A variation of this approach is the **chain ratio method**. This method involves multiplying a base number by a chain of adjusting percentages. For example, ConnectPhone's product is designed to replace a household's telephone as well as provide "always on" Internet access. Thus, only households with broadband Internet access will be able to use the product. Finally, not all Internet households will be willing and able to purchase the new product. ConnectPhone can estimate U.S. demand using a chain of calculations like the following:

Total number of U.S. households
 × The percentage of U.S. households with broadband Internet access
 × The percentage of these households willing and able to buy this device

The U.S. Census Bureau estimates that there are approximately 113 million households in the United States.³ Research also indicates that 50 percent of U.S. households have broadband Internet access.⁴ Finally, ConnectPhone's own research indicates that 33.1 percent of households possess the discretionary income needed and are willing to buy a device such as this. Then, the total number of households willing and able to purchase this product is:

$$113 \text{ million households} \times 0.50 \times 0.331 = 18.7 \text{ million households}$$

Households will need only one media phone. Assuming the average retail price across all brands is \$750 for this product, the estimate of total market demand is as follows:

$$18.7 \text{ million households} \times 1 \text{ device per household} \times \$750 = \$14 \text{ billion}$$

Total market demand

The total volume that would be bought by a defined consumer group, in a defined geographic area, in a defined time period, in a defined marketing environment, under a defined level and mix of industry marketing effort.

Market potential

The upper limit of market demand.

Chain ratio method

Estimating market demand by multiplying a base number by a chain of adjusting percentages.

This simple chain of calculations gives ConnectPhone only a rough estimate of potential demand. However, more detailed chains involving additional segments and other qualifying factors would yield more accurate and refined estimates. Still, these are only *estimates* of market potential. They rely heavily on assumptions regarding adjusting percentages, average quantity, and average price. Thus, ConnectPhone must make certain that its assumptions are reasonable and defensible. As can be seen, the overall market potential in dollar sales can vary widely given the average price used. For this reason, ConnectPhone will use unit sales potential to determine its sales estimate for next year. Market potential in terms of units is 18.7 million (18.7 million households \times 1 device per household).

Assuming that ConnectPhone wants to attain 2 percent market share (comparable to its share of the Internet modem market) in the first year after launching this product, then it can forecast unit sales at 18.7 million units \times 0.02 = 374,000 units. At a selling price of \$336 per unit, this translates into sales of \$125,664,000 (374,000 units \times \$336 per unit). For simplicity, further analyses will use forecasted sales of \$125 million.

This unit volume estimate is well within ConnectPhone's production capacity and exceeds not only the break-even estimate (232,559 units) calculated earlier, but also the volume necessary to realize a \$5 million profit (290,698 units) or a 30 percent return on investment (267,442 units). However, this forecast falls well short of the volume necessary to realize a 25 percent return on sales (10 million units!) and may require that ConnectPhone revise expectations.

To assess expected profits, we must now look at the budgeted expenses for launching this product. To do this, we will construct a pro forma profit-and-loss statement.

The Profit-and-Loss Statement and Marketing Budget (pp A18–A19)

All marketing managers must account for the profit impact of their marketing strategies. A major tool for projecting such profit impact is a **pro forma** (or projected) **profit-and-loss statement** (also called an **income statement** or **operating statement**). A pro forma statement shows projected revenues less budgeted expenses and estimates the projected net profit for an organization, product, or brand during a specific planning period, typically a year. It includes direct product production costs, marketing expenses budgeted to attain a given sales forecast, and overhead expenses assigned to the organization or product. A profit-and-loss statement typically consists of several major components (see **Table A2.1**):

- *Net sales*—gross sales revenue minus returns and allowances (for example, trade, cash, quantity, and promotion allowances). ConnectPhone's net sales for 2011 are estimated to be \$125 million, as determined in the previous analysis.
- *Cost of goods sold*—(sometimes called *cost of sales*)—the actual cost of the merchandise sold by a manufacturer or reseller. It includes the cost of inventory, purchases, and other costs associated with making the goods. ConnectPhone's cost of goods sold is estimated to be 50 percent of net sales, or \$62.5 million.
- *Gross margin (or gross profit)*—the difference between net sales and cost of goods sold. ConnectPhone's gross margin is estimated to be \$62.5 million.
- *Operating expenses*—the expenses incurred while doing business. These include all other expenses beyond the cost of goods sold that are necessary to conduct business. Operating expenses can be presented in total or broken down in detail. Here, ConnectPhone's estimated operating expenses include *marketing expenses* and *general and administrative expenses*.

Marketing expenses include sales expenses, promotion expenses, and distribution expenses. The new product will be sold through ConnectPhone's sales force, so the company budgets \$5 million for sales salaries. However, because sales representatives earn a 10 percent commission on sales, ConnectPhone must also add a variable component to sales expenses of \$12.5 million (10 percent of \$125 million net sales), for a total budgeted sales

Pro forma (or projected) profit-and-loss statement (or income statement or operating statement)

A statement that shows projected revenues less budgeted expenses and estimates the projected net profit for an organization, product, or brand during a specific planning period, typically a year.

● TABLE | A2.1 Pro Forma Profit-and-Loss Statement for the 12-Month Period Ended December 31, 2011

		% of Sales
Net Sales	\$125,000,000	100%
Cost of Goods Sold	<u>62,500,000</u>	<u>50%</u>
Gross Margin	\$62,500,000	50%
Marketing Expenses		
Sales expenses	\$17,500,000	
Promotion expenses	15,000,000	
Freight	<u>12,500,000</u>	45,000,000
General and Administrative Expenses		
Managerial salaries and expenses	\$2,000,000	
Indirect overhead	<u>3,000,000</u>	<u>5,000,000</u>
Net Profit Before Income Tax	\$12,500,000	10%

expense of \$17.5 million. ConnectPhone sets its advertising and promotion to launch this product at \$10 million. However, the company also budgets 4 percent of sales, or \$5 million, for cooperative advertising allowances to retailers who promote ConnectPhone's new product in their advertising. Thus, the total budgeted advertising and promotion expenses are \$15 million (\$10 million for advertising plus \$5 million in co-op allowances). Finally, ConnectPhone budgets 10 percent of net sales, or \$12.5 million, for freight and delivery charges. In all, total marketing expenses are estimated to be \$17.5 million + \$15 million + \$12.5 million = \$45 million.

General and administrative expenses are estimated at \$5 million, broken down into \$2 million for managerial salaries and expenses for the marketing function and \$3 million of indirect overhead allocated to this product by the corporate accountants (such as depreciation, interest, maintenance, and insurance). Total expenses for the year, then, are estimated to be \$50 million (\$45 million marketing expenses + \$5 million in general and administrative expenses).

- *Net profit before taxes*—profit earned after all costs are deducted. ConnectPhone's estimated net profit before taxes is \$12.5 million.

In all, as Table A2.1 shows, ConnectPhone expects to earn a profit on its new product of \$12.5 million in 2011. Also note that the percentage of sales that each component of the profit-and-loss statement represents is given in the right-hand column. These percentages are determined by dividing the cost figure by net sales (that is, marketing expenses represent 36 percent of net sales determined by \$45 million ÷ \$125 million). As can be seen, ConnectPhone projects a net profit return on sales of 10 percent in the first year after launching this product.

Marketing Performance Measures (pp A19–A23)

Now let's fast-forward a year. ConnectPhone's product has been on the market for one year and management wants to assess its sales and profit performance. One way to assess this performance is to compute performance ratios derived from ConnectPhone's **profit-and-loss statement** (or **income statement** or **operating statement**).

Whereas the pro forma profit-and-loss statement shows *projected* financial performance, the statement given in ● Table A2.2 shows ConnectPhone's *actual* financial performance based on actual sales, cost of goods sold, and expenses during the past year. By comparing the profit-and-loss statement from one period to the next, ConnectPhone can gauge performance against goals, spot favorable or unfavorable trends, and take appropriate corrective action.

The profit-and-loss statement shows that ConnectPhone lost \$1 million rather than making the \$12.5 million profit projected in the pro forma statement. Why? One obvious

Profit-and-loss statement (or income statement or operating statement)

A statement that shows actual revenues less expenses and net profit for an organization, product, or brand during a specific planning period, typically a year.

● TABLE | A2.2 Profit-and-Loss Statement for the 12-Month Period Ended December 31, 2011

		% of Sales
Net Sales	\$100,000,000	100%
Cost of Goods Sold	<u>55,000,000</u>	<u>55%</u>
Gross Margin	\$45,000,000	45%
Marketing Expenses		
Sales expenses	\$15,000,000	
Promotion expenses	14,000,000	
Freight	<u>10,000,000</u>	39%
General and Administrative Expenses		
Managerial salaries and expenses	\$2,000,000	
Indirect overhead	<u>5,000,000</u>	<u>7%</u>
Net Profit Before Income Tax	(\$1,000,000)	(1%)

reason is that net sales fell \$25 million short of estimated sales. Lower sales translated into lower variable costs associated with marketing the product. However, both fixed costs and the cost of goods sold as a percentage of sales exceeded expectations. Hence, the product's contribution margin was 21 percent rather than the estimated 26 percent. That is, variable costs represented 79 percent of sales (55 percent for cost of goods sold, 10 percent for sales commissions, 10 percent for freight, and 4 percent for co-op allowances). Recall that contribution margin can be calculated by subtracting that fraction from one ($1 - 0.79 = 0.21$). Total fixed costs were \$22 million, \$2 million more than estimated. Thus, the sales that ConnectPhone needed to break even given this cost structure can be calculated as:

$$\text{Break-even sales} = \frac{\text{fixed costs}}{\text{contribution margin}} = \frac{\$22,000,000}{0.21} = \$104,761,905$$

If ConnectPhone had achieved another \$5 million in sales, it would have earned a profit.

Although ConnectPhone's sales fell short of the forecasted sales, so did overall industry sales for this product. Overall industry sales were only \$2.5 billion. That means that ConnectPhone's **market share** was 4 percent ($\$100 \text{ million} \div \$2.5 \text{ billion} = 0.04 = 4\%$), which was higher than forecasted. Thus, ConnectPhone attained a higher-than-expected market share but the overall market sales were not as high as estimated.

Market share

Company sales divided by market sales.

Analytic Ratios

The profit-and-loss statement provides the figures needed to compute some crucial **operating ratios**—the ratios of selected operating statement items to net sales. These ratios let marketers compare the firm's performance in one year to that in previous years (or with industry standards and competitors' performance in that year). The most commonly used operating ratios are the gross margin percentage, the net profit percentage, and the operating expense percentage. The inventory turnover rate and return on investment (ROI) are often used to measure managerial effectiveness and efficiency.

Operating ratios

The ratios of selected operating statement items to net sales.

The **gross margin percentage** indicates the percentage of net sales remaining after cost of goods sold that can contribute to operating expenses and net profit before taxes. The higher this ratio, the more a firm has left to cover expenses and generate profit. ConnectPhone's gross margin ratio was 45 percent:

Gross margin percentage

The percentage of net sales remaining after cost of goods sold—calculated by dividing gross margin by net sales.

$$\text{Gross margin percentage} = \frac{\text{gross margin}}{\text{net sales}} = \frac{\$45,000,000}{\$100,000,000} = 0.45 = 45\%$$

Note that this percentage is lower than estimated, and this ratio is seen easily in the percentage of sales column in Table A2.2. Stating items in the profit-and-loss statement as a percent of sales allows managers to quickly spot abnormal changes in costs over time. If there was previous history for this product and this ratio was declining, management should examine it more closely to determine why it has decreased (that is, because of a decrease in sales volume or price, an increase in costs, or a combination of these). In ConnectPhone's case, net sales were \$25 million lower than estimated, and cost of goods sold was higher than estimated (55 percent rather than the estimated 50 percent).

Net profit percentage

The percentage of each sales dollar going to profit—calculated by dividing net profits by net sales.

The **net profit percentage** shows the percentage of each sales dollar going to profit. It is calculated by dividing net profits by net sales:

$$\text{Net profit percentage} = \frac{\text{net profit}}{\text{net sales}} = \frac{-\$1,000,000}{\$100,000,000} = -0.01 = -1.0\%$$

This ratio is easily seen in the percent of sales column. ConnectPhone's new product generated negative profits in the first year, not a good situation given that before the product launch net profits before taxes were estimated at more than \$12 million. Later in this appendix, we will discuss further analyses the marketing manager should conduct to defend the product.

Operating expense percentage

The portion of net sales going to operating expenses—calculated by dividing total expenses by net sales.

The **operating expense percentage** indicates the portion of net sales going to operating expenses. Operating expenses include marketing and other expenses not directly related to marketing the product, such as indirect overhead assigned to this product. It is calculated by:

$$\text{Operating expense percentage} = \frac{\text{total expenses}}{\text{net sales}} = \frac{\$46,000,000}{\$100,000,000} = 0.46 = 46\%$$

This ratio can also be quickly determined from the percent of sales column in the profit-and-loss statement by adding the percentages for marketing expenses and general and administrative expenses (39% + 7%). Thus, 46 cents of every sales dollar went for operations. Although ConnectPhone wants this ratio to be as low as possible, and 46 percent is not an alarming amount, it is of concern if it is increasing over time or if a loss is realized.

Inventory turnover rate (or stockturn rate)

The number of times an inventory turns over or is sold during a specified time period (often one year)—calculated based on costs, selling price, or units.

Another useful ratio is the **inventory turnover rate** (also called **stockturn rate** for resellers). The inventory turnover rate is the number of times an inventory turns over or is sold during a specified time period (often one year). This rate tells how quickly a business is moving inventory through the organization. Higher rates indicate that lower investments in inventory are made, thus freeing up funds for other investments. It may be computed on a cost, selling price, or unit basis. The formula based on cost is:

$$\text{Inventory turnover rate} = \frac{\text{cost of goods sold}}{\text{average inventory at cost}}$$

Assuming ConnectPhone's beginning and ending inventories were \$30 million and \$20 million, respectively, the inventory turnover rate is:

$$\text{Inventory turnover rate} = \frac{\$55,000,000}{(\$30,000,000 + \$20,000,000)/2} = \frac{\$55,000,000}{\$25,000,000} = 2.2$$

That is, ConnectPhone's inventory turned over 2.2 times in 2011. Normally, the higher the turnover rate, the higher the management efficiency and company profitability. However, this rate should be compared to industry averages, competitors' rates, and past performance to determine if ConnectPhone is doing well. A competitor with similar sales but a higher inventory turnover rate will have fewer resources tied up in inventory, allowing it to invest in other areas of the business.

Return on investment (ROI)

A measure of managerial effectiveness and efficiency—net profit before taxes divided by total investment.

Companies frequently use **return on investment (ROI)** to measure managerial effectiveness and efficiency. For ConnectPhone, ROI is the ratio of net profits to total investment required to manufacture the new product. This investment includes capital investments in land, buildings, and equipment (here, the initial \$10 million to refurbish the manufacturing facility) plus inventory costs (ConnectPhone's average inventory totaled \$25 million), for a total of \$35 million. Thus, ConnectPhone's ROI for this product is:

$$\text{Return on investment} = \frac{\text{net profit before taxes}}{\text{investment}} = \frac{-\$1,000,000}{\$35,000,000} = -0.286 = -2.86\%$$

ROI is often used to compare alternatives, and a positive ROI is desired. The alternative with the highest ROI is preferred to other alternatives. ConnectPhone needs to be concerned with the ROI realized. One obvious way ConnectPhone can increase ROI is to increase net profit by reducing expenses. Another way is to reduce its investment, perhaps by investing less in inventory and turning it over more frequently.

Marketing Profitability Metrics

Given the above financial results, you may be thinking that ConnectPhone should drop this new product. But what arguments can marketers make for keeping or dropping this product? The obvious arguments for dropping the product are that first-year sales were well below expected levels and the product lost money, resulting in a negative return on investment.

So what would happen if ConnectPhone did drop this product? Surprisingly, if the company drops the product, the profits for the total organization will decrease by \$4 million! How can that be? Marketing managers need to look closely at the numbers in the profit-and-loss statement to determine the *net marketing contribution* for this product. In ConnectPhone's case, the net marketing contribution for the product is \$4 million, and if the company drops this product, that contribution will disappear as well. Let's look more closely at this concept to illustrate how marketing managers can better assess and defend their marketing strategies and programs.

Net Marketing Contribution

Net marketing contribution (NMC), along with other marketing metrics derived from it, measures *marketing* profitability. It includes only components of profitability that are controlled by marketing. Whereas the previous calculation of net profit before taxes from the profit-and-loss statement includes operating expenses not under marketing's control, NMC does not. Referring back to ConnectPhone's profit-and-loss statement given in Table A2.2, we can calculate net marketing contribution for the product as:

$$\begin{aligned} \text{NMC} &= \text{net sales} - \text{cost of goods sold} - \text{marketing expenses} = \\ & \$100 \text{ million} - \$55 \text{ million} - \$41 \text{ million} = \$4 \text{ million} \end{aligned}$$

The marketing expenses include sales expenses (\$15 million), promotion expenses (\$14 million), freight expenses (\$10 million), and the managerial salaries and expenses of the marketing function (\$2 million), which total \$41 million.

Thus, the product actually contributed \$4 million to ConnectPhone's profits. It was the \$5 million of indirect overhead allocated to this product that caused the negative profit. Further, the amount allocated was \$2 million more than estimated in the pro forma profit-and-loss statement. Indeed, if only the estimated amount had been allocated, the product would have earned a *profit* of \$1 million rather than losing \$1 million. If ConnectPhone drops the product, the \$5 million in fixed overhead expenses will not disappear—it will simply have to be allocated elsewhere. However, the \$4 million in net marketing contribution *will* disappear.

Marketing Return on Sales and Investment

To get an even deeper understanding of the profit impact of marketing strategy, we'll now examine two measures of marketing efficiency—*marketing return on sales* (marketing ROS) and *marketing return on investment* (marketing ROI).⁵

Marketing return on sales (or **marketing ROS**) shows the percent of net sales attributable to the net marketing contribution. For our product, ROS is:

$$\text{Marketing ROS} = \frac{\text{net marketing contribution}}{\text{net sales}} = \frac{\$4,000,000}{\$100,000,000} = 0.04 = 4\%$$

Thus, out of every \$100 of sales, the product returns \$4 to ConnectPhone's bottom line. A high marketing ROS is desirable. But to assess whether this is a good level of performance, ConnectPhone must compare this figure to previous marketing ROS levels for the product, the ROSs of other products in the company's portfolio, and the ROSs of competing products.

Net marketing contribution (NMC)

A measure of marketing profitability that includes only components of profitability controlled by marketing.

Marketing return on sales (or marketing ROS)

The percent of net sales attributable to the net marketing contribution—calculated by dividing net marketing contribution by net sales.

Marketing return on investment (or marketing ROI)

A measure of the marketing productivity of a marketing investment—calculated by dividing net marketing contribution by marketing expenses.

Marketing return on investment (or marketing ROI) measures the marketing productivity of a marketing investment. In ConnectPhone's case, the marketing investment is represented by \$41 million of the total expenses. Thus, marketing ROI is:

$$\text{Marketing ROI} = \frac{\text{net marketing contribution}}{\text{marketing expenses}} = \frac{\$4,000,000}{\$41,000,000} = 0.0976 = 9.76\%$$

As with marketing ROS, a high value is desirable, but this figure should be compared with previous levels for the given product and with the marketing ROIs of competitors' products. Note from this equation that marketing ROI could be greater than 100 percent. This can be achieved by attaining a higher net marketing contribution and/or a lower total marketing expense.

In this section, we estimated market potential and sales, developed profit-and-loss statements, and examined financial measures of performance. In the next section, we discuss methods for analyzing the impact of various marketing tactics. However, before moving on to those analyses, here's another set of quantitative exercises to help you apply what you've learned to other situations.

Marketing by the Numbers Exercise Set Two

- 2.1 Determine the market potential for a product that has 50 million prospective buyers who purchase an average of 3 per year and price averages \$25. How many units must a company sell if it desires a 10 percent share of this market?
- 2.2 Develop a profit-and-loss statement for the Westgate division of North Industries. This division manufactures light fixtures sold to consumers through home improvement and hardware stores. Cost of goods sold represents 40 percent of net sales. Marketing expenses include selling expenses, promotion expenses, and freight. Selling expenses include sales salaries totaling \$3 million per year and sales commissions (5 percent of sales). The company spent \$3 million on advertising last year, and freight costs were 10 percent of sales. Other costs include \$2 million for managerial salaries and expenses for the marketing function and another \$3 million for indirect overhead allocated to the division.
 - a. Develop the profit-and-loss statement if net sales were \$20 million last year.
 - b. Develop the profit-and-loss statement if net sales were \$40 million last year.
 - c. Calculate Westgate's break-even sales.
- 2.3 Using the profit-and-loss statement you developed in question 2.2b, and assuming that Westgate's beginning inventory was \$11 million, ending inventory was \$7 million, and total investment was \$20 million including inventory, determine the following:
 - a. gross margin percentage
 - b. net profit percentage
 - c. operating expense percentage
 - d. inventory turnover rate
 - e. return on investment (ROI)
 - f. net marketing contribution
 - g. marketing return on sales (marketing ROS)
 - h. marketing return on investment (marketing ROI)
 - i. Is the Westgate division doing well? Explain your answer.

Financial Analysis of Marketing Tactics (pp A23–A28)

Although the first-year profit performance for ConnectPhone's new product was less than desired, management feels that this attractive market has excellent growth opportunities. Although the sales of ConnectPhone's product were lower than initially projected, they were not unreasonable given the size of the current market. Thus, ConnectPhone wants to explore new marketing tactics to help grow the market for this product and increase sales for the company.

For example, the company could increase advertising to promote more awareness of the new product and its category. It could add salespeople to secure greater product distribution. ConnectPhone could decrease prices so that more consumers could afford its product. Finally, to expand the market, ConnectPhone could introduce a lower-priced model in addition to the higher-priced original offering. Before pursuing any of these tactics, ConnectPhone must analyze the financial implications of each.

Increase Advertising Expenditures

Although most consumers understand the Internet and telephones, they may not be aware of media phones. Thus, ConnectPhone is considering boosting its advertising to make more people aware of the benefits of this device in general and of its own brand in particular.

What if ConnectPhone's marketers recommend increasing national advertising by 50 percent to \$15 million (assume no change in the variable cooperative component of promotional expenditures)? This represents an increase in fixed costs of \$5 million. What increase in sales will be needed to break even on this \$5 million increase in fixed costs?

A quick way to answer this question is to divide the increase in fixed cost by the contribution margin, which we found in a previous analysis to be 21 percent:

$$\text{Increase in sales} = \frac{\text{increase in fixed cost}}{\text{contribution margin}} = \frac{\$5,000,000}{0.21} = \$23,809,524$$

Thus, a 50 percent increase in advertising expenditures must produce a sales increase of almost \$24 million to just break even. That \$24 million sales increase translates into an almost 1 percentage point increase in market share (1 percent of the \$2.5 billion overall market equals \$25 million). That is, to break even on the increased advertising expenditure, ConnectPhone would have to increase its market share from 4 percent to 4.95 percent ($\$23,809,524 \div \$2.5 \text{ billion} = 0.0495$ or 4.95% market share). All of this assumes that the total market will not grow, which might or might not be a reasonable assumption.

Increase Distribution Coverage

ConnectPhone also wants to consider hiring more salespeople in order to call on new retailer accounts and increase distribution through more outlets. Even though ConnectPhone sells directly to wholesalers, its sales representatives call on retail accounts to perform other functions in addition to selling, such as training retail salespeople. Currently, ConnectPhone employs 60 sales reps who earn an average of \$50,000 in salary plus 10 percent commission on sales. The product is currently sold to consumers through 1,875 retail outlets. Suppose ConnectPhone wants to increase that number of outlets to 2,500, an increase of 625 retail outlets. How many additional salespeople will ConnectPhone need, and what sales will be necessary to break even on the increased cost?

One method for determining what size sales force ConnectPhone will need is the **workload method**. The workload method uses the following formula to determine the salesforce size:

$$NS = \frac{NC \times FC \times LC}{TA}$$

where

NS = number of salespeople

NC = number of customers

FC = average frequency of customer calls per customer

LC = average length of customer call

TA = time an average salesperson has available for selling per year

ConnectPhone's sales reps typically call on accounts an average of 20 times per year for about 2 hours per call. Although each sales rep works 2,000 hours per year (50 weeks per

Workload method

An approach to determining sales force size based on the workload required and the time available for selling.

year × 40 hours per week), they spent about 15 hours per week on nonselling activities such as administrative duties and travel. Thus, the average annual available selling time per sales rep per year is 1,250 hours (50 weeks × 25 hours per week). We can now calculate how many sales reps ConnectPhone will need to cover the anticipated 2,500 retail outlets:

$$NS = \frac{2,500 \times 20 \times 2}{1,250} = 80 \text{ salespeople}$$

Therefore, ConnectPhone will need to hire 20 more salespeople. The cost to hire these reps will be \$1 million (20 salespeople × \$50,000 salary per sales person).

What increase in sales will be required to break even on this increase in fixed costs? The 10 percent commission is already accounted for in the contribution margin, so the contribution margin remains unchanged at 21 percent. Thus, the increase in sales needed to cover this increase in fixed costs can be calculated by:

$$\text{Increase in sales} = \frac{\text{increase in fixed cost}}{\text{contribution margin}} = \frac{\$1,000,000}{0.21} = \$4,761,905$$

That is, ConnectPhone’s sales must increase almost \$5 million to break even on this tactic. So, how many new retail outlets will the company need to secure to achieve this sales increase? The average revenue generated per current outlet is \$53,333 (\$100 million in sales divided by 1,875 outlets). To achieve the nearly \$5 million sales increase needed to break even, ConnectPhone would need about 90 new outlets (\$4,761,905 ÷ \$53,333 = 89.3 outlets), or about 4.5 outlets per new rep. Given that current reps cover about 31 outlets apiece (1,875 outlets ÷ 60 reps), this seems very reasonable.

Decrease Price

ConnectPhone is also considering lowering its price to increase sales revenue through increased volume. The company’s research has shown that demand for most types of consumer electronics products is elastic—that is, the percentage increase in the quantity demanded is greater than the percentage decrease in price.

What increase in sales would be necessary to break even on a 10 percent decrease in price? That is, what increase in sales will be needed to maintain the total contribution that ConnectPhone realized at the higher price? The current total contribution can be determined by multiplying the contribution margin by total sales:⁶

$$\begin{aligned} \text{Current total contribution} &= \text{contribution margin} \times \text{sales} = \\ &.21 \times \$100 \text{ million} = \$21 \text{ million} \end{aligned}$$

Price changes result in changes in unit contribution and contribution margin. Recall that the contribution margin of 21 percent was based on variable costs representing 79 percent of sales. Therefore, unit variable costs can be determined by multiplying the original price by this percentage: \$336 × 0.79 = \$265.44 per unit. If price is decreased by 10 percent, the new price is \$302.40. However, variable costs do not change just because price decreased, so the contribution and contribution margin decrease as follows:

	Old	New (reduced 10%)
Price	\$336	\$302.40
– Unit variable cost	\$265.44	\$265.44
= Unit contribution	\$70.56	\$36.96
Contribution margin	\$70.56/\$336 = 0.21 or 21%	\$36.96/\$302.40 = 0.12 or 12%

So a 10 percent reduction in price results in a decrease in the contribution margin from 21 percent to 12 percent.⁷ To determine the sales level needed to break even on this price reduction,

we calculate the level of sales that must be attained at the new contribution margin to achieve the original total contribution of \$21 million:

$$\text{New contribution margin} \times \text{new sales level} = \text{original total contribution}$$

So,

$$\text{New sales level} = \frac{\text{original contribution}}{\text{new contribution margin}} = \frac{\$21,000,000}{0.12} = \$175,000,000$$

Thus, sales must increase by \$75 million (\$175 million – \$100 million) just to break even on a 10 percent price reduction. This means that ConnectPhone must increase market share to 7 percent (\$175 million ÷ \$2.5 billion) to achieve the current level of profits (assuming no increase in the total market sales). The marketing manager must assess whether or not this is a reasonable goal.

Extend the Product Line

As a final option, ConnectPhone is considering extending its product line by offering a lower-priced model. Of course, the new, lower-priced product would steal some sales from the higher-priced model. This is called **cannibalization**—the situation in which one product sold by a company takes a portion of its sales from other company products. If the new product has a lower contribution than the original product, the company’s total contribution will decrease on the cannibalized sales. However, if the new product can generate enough new volume, it is worth considering.

To assess cannibalization, ConnectPhone must look at the incremental contribution gained by having both products available. Recall in the previous analysis we determined that unit variable costs were \$265.44 and unit contribution was just over \$70. Assuming costs remain the same next year, ConnectPhone can expect to realize a contribution per unit of approximately \$70 for every unit of the original product sold.

Assume that the first model offered by ConnectPhone is called MP1 and the new, lower-priced model is called MP2. MP2 will retail for \$400, and resellers will take the same markup percentages on price as they do with the higher-priced model. Therefore, MP2’s price to wholesalers will be \$224 as follows:

Retail price:	\$400
minus retail margin (30%):	–\$120
Retailer’s cost/wholesaler’s price:	\$280
minus wholesaler’s margin (20%):	–\$56
Wholesaler’s cost/ConnectPhone’s price	\$224

If MP2’s variable costs are estimated to be \$174, then its contribution per unit will equal \$50 (\$224 – \$174 = \$50). That means for every unit that MP2 cannibalizes from MP1, ConnectPhone will *lose* \$20 in contribution toward fixed costs and profit (that is, contribution_{MP2} – contribution_{MP1} = \$50 – \$70 = –\$20). You might conclude that ConnectPhone should not pursue this tactic because it appears as though the company will be worse off if it introduces the lower-priced model. However, if MP2 captures enough *additional* sales, ConnectPhone will be better off even though some MP1 sales are cannibalized. The company must examine what will happen to *total* contribution, which requires estimates of unit volume for both products.

Originally, ConnectPhone estimated that next year’s sales of MP1 would be 600,000 units. However, with the introduction of MP2, it now estimates that 200,000 of those sales will be cannibalized by the new model. If ConnectPhone sells only 200,000 units of the new MP2 model (all cannibalized from MP1), the company would lose \$4 million in total contribution

Cannibalization

The situation in which one product sold by a company takes a portion of its sales from other company products.

(200,000 units × −\$20 per cannibalized unit = −\$4 million)—not a good outcome. However, ConnectPhone estimates that MP2 will generate the 200,000 of cannibalized sales plus an *additional* 500,000 unit sales. Thus, the contribution on these additional MP2 units will be \$25 million (i.e., 500,000 units × \$50 per unit = \$25 million). The net effect is that ConnectPhone will gain \$21 million in total contribution by introducing MP2.

The following table compares ConnectPhone’s total contribution with and without the introduction of MP2:

	MP1 only	MP1 and MP2
MP1 contribution	600,000 units × \$70 = \$42,000,000	400,000 units × \$70 = \$28,000,000
MP2 contribution	0	700,000 units × \$50 = \$35,000,000
Total contribution	\$42,000,000	\$63,000,000

The difference in the total contribution is a net gain of \$21 million (\$63 million − \$42 million). Based on this analysis, ConnectPhone should introduce the MP2 model because it results in a positive incremental contribution. However, if fixed costs will increase by more than \$21 million as a result of adding this model, then the net effect will be negative and ConnectPhone should not pursue this tactic.

Now that you have seen these marketing tactic analysis concepts in action as they related to ConnectPhone’s new product, here are several exercises for you to apply what you have learned in this section in other contexts.

Marketing by the Numbers Exercise Set Three

- 3.1 Kingsford, Inc. sells small plumbing components to consumers through retail outlets. Total industry sales for Kingsford’s relevant market last year were \$80 million, with Kingsford’s sales representing 10 percent of that total. Contribution margin is 25 percent. Kingsford’s sales force calls on retail outlets and each sales rep earns \$45,000 per year plus 1 percent commission on all sales. Retailers receive a 40 percent margin on selling price and generate average revenue of \$10,000 per outlet for Kingsford.
 - a. The marketing manager has suggested increasing consumer advertising by \$300,000. By how much would dollar sales need to increase to break even on this expenditure? What increase in overall market share does this represent?
 - b. Another suggestion is to hire three more sales representatives to gain new consumer retail accounts. How many new retail outlets would be necessary to break even on the increased cost of adding three sales reps?
 - c. A final suggestion is to make a 20 percent across-the-board price reduction. By how much would dollar sales need to increase to maintain Kingsford’s current contribution? (See endnote 13 to calculate the new contribution margin.)
 - d. Which suggestion do you think Kingsford should implement? Explain your recommendation.

- 3.2 PepsiCo sells its soft drinks in approximately 400,000 retail establishments, such as supermarkets, discount stores, and convenience stores. Sales representatives call on each retail account weekly, which means each account is called on by a sales rep 52 times per year. The average length of a sales call is 75 minutes (or 1.25 hours). An average salesperson works 2,000 hours per year (50 weeks per year × 40 hours per week), but each spends 10 hours a week on nonselling activities, such as administrative tasks and travel. How many sales people does PepsiCo need?

- 3.3 Hair Zone manufactures a brand of hair-styling gel. It is considering adding a modified version of the product—a foam that provides stronger hold. Hair Zone's variable costs and prices to wholesalers are:

	Current Hair Gel	New Foam Product
Unit selling price	2.00	2.25
Unit variable costs	.85	1.25

Hair Zone expects to sell 1 million units of the new styling foam in the first year after introduction, but it expects that 60 percent of those sales will come from buyers who normally purchase Hair Zone's styling gel. Hair Zone estimates that it would sell 1.5 million units of the gel if it did not introduce the foam. If the fixed cost of launching the new foam will be \$100,000 during the first year, should Hair Zone add the new product to its line? Why or why not?