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Pricing Strategy

ROBERT J. DOLAN
HARVARD BUSINESS SCHOOL

JOHN T. GOURVILLE
HARVARD BUSINESS SCHOOL

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Robert J. Dolan, MBA Class of 1952 Baker Foundation Professor of Business Administration, Harvard Business School, and John T. Gourville, Albert J. Weatherhead, Jr., Professor of Business Administration, Harvard Business School, developed this Core Reading with the assistance of writer Amy Handlin, Associate Professor of Marketing, Monmouth University.

1 INTRODUCTION

Business wisdom holds that the core purpose of a firm's marketing activities is to *create value* for the customers it chooses to serve. Three of the four elements of the marketing mix (the four Ps) are central to this purpose: the *product* being offered to customers,[a] *promotion* (how the firm communicates to potential customers about that product), and *place* (how and where the firm makes that product available to customers).

The job of the fourth P, *price*—the topic of this reading—is to specify how the value that has been created can be divided appropriately between the customer (providing her an incentive to buy the product) and the organization (covering the costs associated with the value-creation effort and providing funds for profit and reinvestment in the organization). For more information on the interplay of the four Ps, see *Core Reading: Framework for Marketing Strategy Formation* (HBP No. 8153).

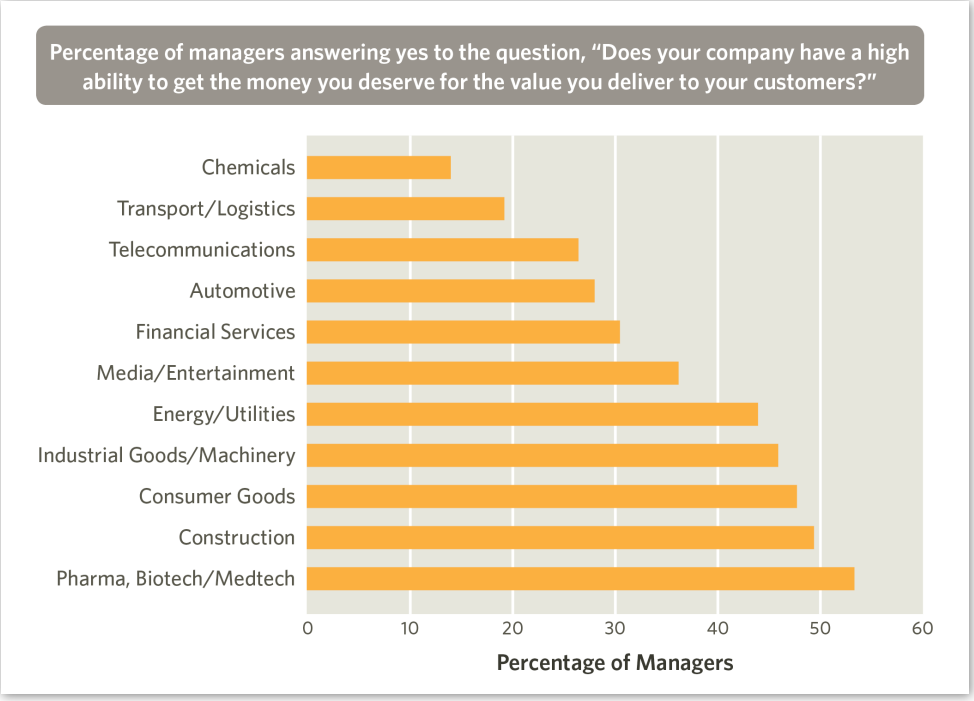
Pricing's critical nature is readily seen by the dramatic impact its effective management can have on the bottom line. Pricing researchers have noted that "[t]he fastest and most effective way for a company to realize its maximum profit is to get its pricing right. The right price can boost profit faster than increasing volume will. . . ."[1] This assessment was supported by an analysis of over 2,400 firms, which found that a 1% improvement in price realization (i.e., a 1% increase in the average price received with no change in sales volume) led to an average improvement in operating profit of 11.1%, while a 1% improvement in sales volume (with no change in average price) led to an average increase in profitability of only 3.3%. In 2013, for instance, a 1% improvement in price realization would have increased the profitability of DuPont by 7.4%, of Nike by 10.2%, of Boeing by 18.9%, and of Walmart by over 27%.[2]

Researchers have long favored using a value perspective in pricing, or simply value pricing, which means basing the price of a product on its value to its chosen customers. For example, in the 1980s, Elliot Ross provided a diagnostic test for shrewd pricing, with one key question in that test being, "Do you know the economic value of your product to your customers?" He further noted that effective pricers regularly asked, "Is the price accurately keyed to the value to the customer?"[3] A decade later, Dolan and Simon set out a pricing IQ test to assist organizations in becoming power pricers. Such an organization, they wrote, "rigorously assesses the value of its products and services, sees how this value varies across customers, and understands the drivers of value variation." The power pricer uses that understanding of customer value to focus the pricing process.[4]

Value pricing hinges on two key elements. The first is a *value orientation*—a focus on the economic value created by an organization's product for a given customer. The second is a set of *processes* to capture a portion of that value for the firm. Simon-Kucher & Partners, a leading pricing consulting firm, regularly surveys executives on their perceptions of how well their companies do in capturing a fair share of the value they create for customers. **Exhibit 1** shows replies by managers, sorted by industry, suggesting the depth of the challenge most organizations face.

[a] Throughout this reading, the term *product* will refer both to physical goods and to services.

EXHIBIT 1 Perceptions of How Much Value Companies Capture



Taking that question one step further, Liozu and Hinterhuber note the importance of a customer value–based pricing approach—but also that effective implementation "require[s] deep organizational changes that transform the fabric of the firm."[5] While the design and implementation of a true ***value-based pricing*** approach requires a commitment to systematic, rigorous work, the returns on that effort can be substantial. Nagle, Hogan, and Zale report the results of a research program showing "companies that adopted a value-based pricing strategy *and* built the organizational capabilities to implement the strategy earned 24% higher profits than industry peers."[6]

Despite the documented benefits of a value-based approach, ***cost-oriented pricing*** continues to dominate the marketplace. This approach typically takes the form of cost-plus pricing, an approach in which an organization applies a predetermined markup to its cost to make or obtain the product. A manufacturer, for instance, might tally all the variable costs associated with the production of a good and simply add a markup of 25%. Why is cost-plus pricing so popular? First, the costs of production are relatively easy to estimate or measure. Indeed, in one survey, more than 80% of managers reported being well informed when it came to their organization's variable costs.[7] Second, cost-plus pricing is easy to justify to various stakeholders, with customers generally willing to pay a reasonable markup and investors accepting of a healthy margin. Third, for many organizations, it simplifies an otherwise complex pricing process. For example, consider a plumbing parts supplier that stocks thousands of unique parts. Under a cost-plus rule, adding a percentage to the known acquisition cost of each item completes the pricing job. However, these benefits of cost-plus pricing limit organizations' ability to capture the full price customers might be willing to pay, which can be devastating to the company's bottom line.

In the Essential Reading that follows, we present the value-based approach to pricing, the specific tools for implementing it, and some of the research methods that have benefited organizations. Our perspective is that of a firm setting the price for a differentiated product.

We begin by introducing the basic value-pricing model and presenting the value-pricing thermometer to bring together the needed elements in this approach to pricing. We initially assume that the task is to set a single price across all of the firm's consumer segments.

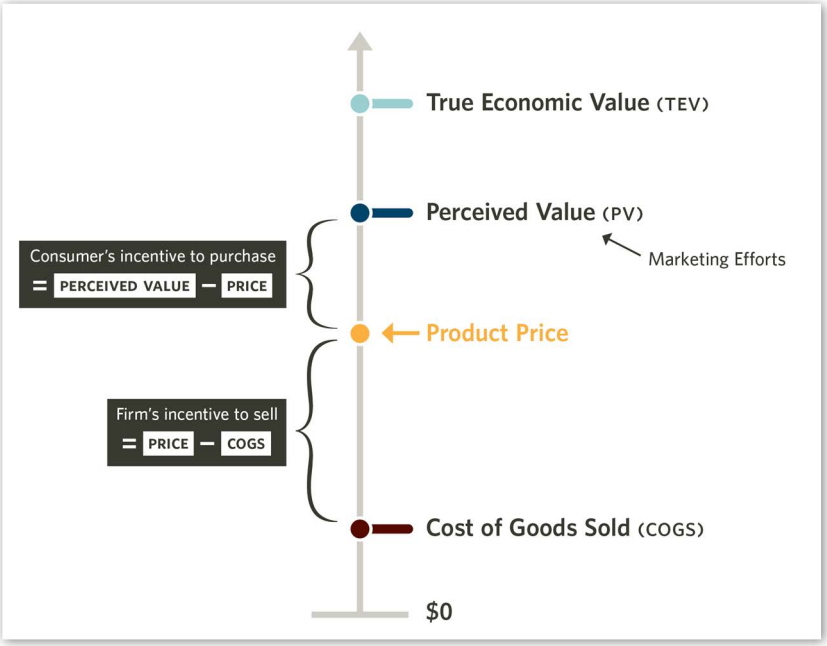
In Section 2.2, we relax that assumption and introduce a concept known as price customization—the potential to set different prices to different consumer segments based on their different valuations of the product being sold. Next, we address how best to set a price within the feasible range—that is, the price range bounded by the customer's perceived value of a product and the organization's costs of goods sold—and introduce two key areas of analysis. First, in Section 2.3, we consider the customers' side of the equation, assessing their sensitivity to price and presenting a framework to help measure that sensitivity. Second, in Section 2.4, we consider the organization's side of the equation, judging the economic impact of various price- and sales-volume scenarios for the organization. Two particularly useful tools in this regard are ***breakeven analysis*** and ***marginal math.***

2 ESSENTIAL READING

2.1 The Value-Pricing Approach

A schematic often used to capture the key elements of value-based pricing is the value-pricing thermometer, which is shown in **Exhibit 2**. As indicated in the exhibit, there are three critical inputs to any value-pricing decision: (1) the true economic value (TEV) of the product to the customer, (2) the perceived value (PV) of the product to that same customer, and (3) the organization's cost of goods sold (COGS).

EXHIBIT 2 The Value-Pricing Thermometer



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At the top of Exhibit 2, the true economic value is the value that a fully informed buyer would or should ascribe to the product. Note that the customer's needs and preferences are important here. Different customers obtain different TEVs from the very same product. For example, a 20-year-old may obtain little or no value from the retirement-planning feature in Intuit's Quicken software, while a 45-year-old may obtain great value.

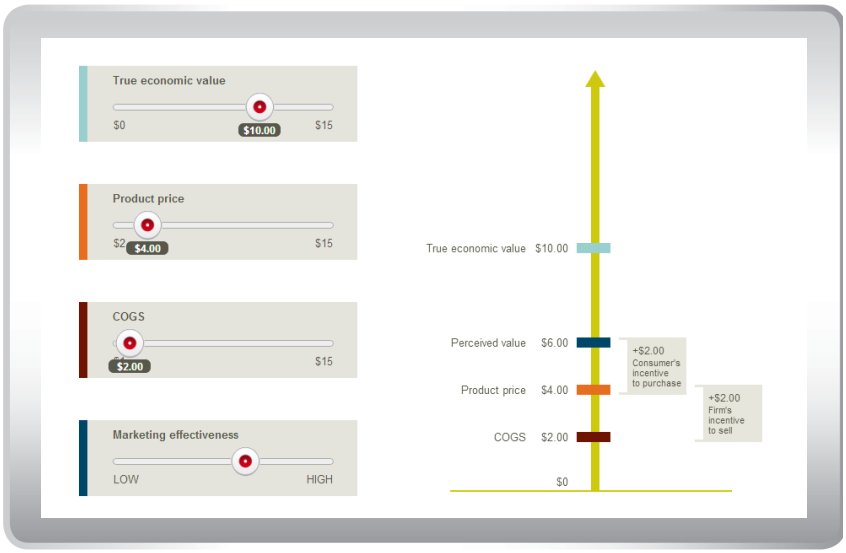
The next input to the pricing thermometer is the perceived value of the product in the mind of the consumer. As shown, the PV typically is less than (and is often much less than) the TEV for a variety of reasons. The customer might not be fully aware of the features or benefits that the product claims to offer, or he might be aware, but he might be skeptical of those claims and their relevance for him. As shown in Exhibit 2, the firm has the potential to influence PV via its marketing efforts.

The final critical input is the firm's cost of goods sold. This generally represents a lower bound on the price an organization would be willing to set. In some cases, for a limited time, a firm may price below COGS to spur initial adoption of a good as part of the general education of the market. Generally, however, firms do not sell below cost on a sustained basis.

Using the dynamic schematic in **Interactive Illustration 1**, explore how setting a product's price affects the allocation of value between a customer and the firm. To start, set a TEV and COGS for a hypothetical product. Next, assess how a firm's marketing efforts affect the perceived value of that product. Finally, consider how price affects a customer's incentive to buy the product and the firm's incentive to sell the product. What happens if price is set low? What happens if price is set high? What happens if the organization increases the price without providing sufficient marketing support?

INTERACTIVE ILLUSTRATION 1 The Value-Pricing Thermometer

Scan this QR code, click the image, or use this link to access the interactive illustration: bit.ly/hbsp2pI1l2e



Let us now look more closely at TEV, PV, and COGS, each in turn.

Assessing True Economic Value (TEV)[8]

Marketers often assess TEV by using a cost-structure study to understand the customer's underlying economics, the performance of competitors' products, and the relative advantage or disadvantage offered by the focal product. Conceptually, TEV has two major components:

TEV = cost of the next-best alternative + value of the performance differential

If the buyer has several available options to choose from, any assessment of TEV has to be relative to the next-best alternative. For example, in assessing the TEV of a flight on the Delta shuttle from Boston to New York, a busy executive could compare the flight to taking the bus or the train. But this would probably lead to an inappropriate assessment, because the next-best alternative is likely a flight on US Airways, flying essentially the same schedule as the Delta shuttle to and from the same airports. In this case, the value of the performance differential would likely be very small, given the similarity between the two airline options. Hence, in this situation, the executive's TEV for the Delta shuttle would be very close to the US Airways price.

This approach is more useful when there is a performance differential to be considered. In particular, a firm's product may be superior to the next-best alternative on some dimensions, but inferior on others. For example, consider a firm trying to sell a new product to the owner of a toy factory that requires an air-filtration system. Assume the factory owner faces two choices—this seller's new product and a well-established, next-best alternative offered by another firm—each with the characteristics seen in **Exhibit 3**.

EXHIBIT 3 Air-Filtration Alternatives for Toy Factory

	New Product	Next-Best Alternative
Probability of system crash	1% over one year	20% over one year
Cost of system crash	$100,000	$100,000
Hours of operation	2,500	2,500
Operating system cost per hour	$15	$10
Price	To be determined	$75,000

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Assume that the system will be used for a single year (after which the factory will be closed) for a total of 2,500 hours. In addition, assume the cost to the toymaker of a system failure is $100,000 (because of production downtime during repairs) and that the filtration-system supplier will bear the cost of any system crash after the first one. Given this information, we can calculate the TEV for the new product to this potential buyer as follows:

$$\begin{aligned}\text{TEV} &= \text{price of next-best alternative} + \text{expected system crash savings} \\ &\qquad - \text{added operating costs} \\ &= \$75{,}000 + \left((20\% \cdot \$100{,}000) - (1\% \cdot \$100{,}000)\right) \\ &\qquad - \left((2{,}500 \text{ hrs} \cdot \$15/\text{hr}) - (2{,}500 \text{ hrs} \cdot \$10/\text{hr})\right) \\ &= \$75{,}000 + \$19{,}000 - \$12{,}500 \\ &= \$81{,}500\end{aligned}$$

Thus, the TEV of the new product for this customer is $81,500—which means that a fully informed, rational buyer with this cost structure should be indifferent between the next-best alternative priced at $75,000 and the new product priced at $81,500.

In practice, assessing TEV is often far more complicated than this, with viable alternatives varying on many important dimensions. For example, the developer of a new anti-blood-clotting drug designed for use in acute cardiac surgeries documented its performance differentials relative to the most-used market alternative, on a number of dimensions, including:[9]

- Reduced time for the drug to take full effect
- Fewer allergic reactions
- Faster rates of recovery
- Reduced likelihood of uncontrolled bleeding
- Fewer additional surgeries
- Lower probability of death

The drug developer's ability to measure and document these performance differentials proved critical both in pricing the new drug and in communicating its value to hospitals and doctors.

Assessing Perceived Value (PV)

While TEV represents what a fully informed, rational consumer *should be* willing to pay for a product, in reality, a buyer's willingness to pay is governed by the value she or he perceives in the new product. And generally, PV is less than TEV.[b] Why? Perhaps the potential buyer is unaware of the relative benefits of the new product. For instance, when digital video recorders (DVRs), such as TiVo, first hit the market in the late 1990s, few people fully understood their functionality. Alternatively, potential buyers might be aware of the claimed benefits but skeptical of those claims, questioning whether the actual gains will be as great as those advertised. Thus, while DVRs were promoted as easy to use, many consumers initially asked, "How easy?," having heard similar lofty claims made for video cassette recorders (VCRs). Finally, buyers may be aware of and fully accept the claimed benefits, but they may not realize how important those benefits will prove to be. For example, few people fully appreciated a DVR's ability to pause live TV until they actually experienced this benefit.

Assessing a customer's PV typically requires market research. One approach to such research would be to probe a given customer's beliefs about the specific benefits offered by the product. Let's return to the case of our toymaker looking for a new air-filtration system. While the new product objectively offers a 1% probability of failure, he might find this claim to be overly optimistic and instead believe the probability of failure is closer to 5%. Just as we calculated the TEV for this air-filtration system for this buyer, we could incorporate those beliefs into our analysis and calculate the PV of this new product for this buyer as follows:

$$\begin{aligned} \text{PV} &= \$75{,}000 + \Big(\big(20\% \cdot \$100{,}000\big) - \big(5\% \cdot \$100{,}000\big)\Big) \\ &\qquad - \Big(\big(2{,}500 \text{ hrs} \cdot \$15/\text{hr}\big) - \big(2{,}500 \text{ hrs} \cdot \$10/\text{hr}\big)\Big) \\ &= \$75{,}000 + \$15{,}000 - \$12{,}500 \\ &= \$77{,}500 \end{aligned}$$

[b] PV sometimes falls above TEV. For instance, in the short run, a buyer may have an incorrect perception of performance and perceive greater value in a product than is actually present.

Therefore, while the TEV of this new air-filtration system for this potential buyer is $81,500, his beliefs about its likely performance benefits drive his PV down to $77,500.

As we've already noted, however, the degree to which PV approaches TEV can often be influenced by the level and quality of the marketing efforts directed toward the customer. Ideally, an organization's marketing efforts should transform an uninformed, skeptical customer (with a resulting low PV) into a fully informed, rational buyer (whose PV approaches TEV).

Consider the pricing challenge the drug company Glaxo faced as it brought Zantac to market. Zantac was second to the market in the ulcer-treatment category; the market pioneer, SmithKline's Tagamet, had already enjoyed all of the scientific acclaim and media attention accorded to a new drug. During Tagamet's first five years on the market, when the drug faced no in-kind competition, SmithKline had gradually reduced Tagamet's price and built it into a blockbuster drug. Given these facts, how should Glaxo have priced Zantac?

Many expected Glaxo to follow the common pharmaceutical practice of pricing the entrant below the incumbent, by pricing Zantac 10% to 15% below Tagamet, the established competitor. However, Glaxo's CEO, Paul Girolami, recognized two things. First, relative to Tagamet, Zantac offered true economic benefits to most patients in the form of more convenient dosing (once a day versus twice a day), greater efficacy, fewer side effects, and fewer adverse interactions with other drugs. Second, with a sufficient investment in a sales force to distribute information and free samples to potential prescribers in clinics and doctors' offices, the clinical data on Zantac's performance would enable Glaxo to achieve a PV that approached its TEV. Supported with a hefty marketing investment, Glaxo introduced Zantac in the United States at a 56% price premium compared to Tagamet. In turn, the performance benefits were proven in use with patients and, despite the price premium, Zantac overtook Tagamet to become the best-selling prescription drug in the world.

Cost of Goods Sold (COGS)

The final input to the pricing decision, and the easiest for most firms to understand and obtain, is cost of goods sold (COGS). This number can often be derived directly from the firm's income statement. It represents the fully loaded variable cost of producing the product being sold. If a firm sells at a price that is equal to or below its COGS, it stands no chance of ever turning a profit. Only if the product sells at a price above its COGS will it begin to contribute to profitability. And if the company can sell enough units at a price high enough above the COGS, it may have a thriving business.

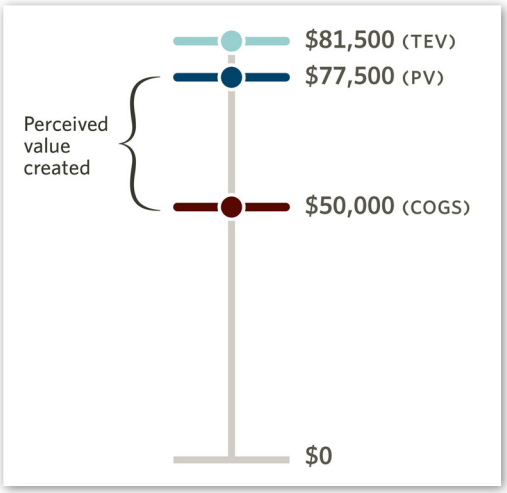
Putting the Pieces Together

Having measured and considered the three inputs to the value approach to pricing—TEV, PV, and COGS—the firm can now generate the feasible solution space for setting price. At the upper end, the firm is bound by the buyers' PV for the product, with this PV influenced both by the TEV of the product for a particular buyer and by how well the company's marketing efforts communicate that TEV. At the same time, the firm is bound on the lower end by its COGS.

Again consider our toymaker. Our previous calculation showed the TEV for the new air-filtration system for his factory to be $81,500. But given the toymaker's belief that the likely failure rate is 5% and not the claimed 1%, his PV is $77,500. Assume also that the maker of this air-filtration system has COGS of $50,000. The resulting value-pricing thermometer for this potential buyer would be the one shown in **Exhibit 4**. In this case, the feasible range for pricing this air-filtration system is $50,000 to $77,500. In a later section, we discuss how best

to select a specific price within this range. Before getting there, however, three important concepts are worth noting.

EXHIBIT 4
Value-Pricing Thermometer for Toymaker



First, within this range, the price that ultimately is set will determine both the firm's and the potential buyer's relative incentives to make the sale happen. If the firm chooses to price high, say, $75,000, it provides itself with a significant incentive to enter the transaction (i.e., $75,000 – $50,000 = $25,000), but it provides only a limited incentive for the potential buyer to do so (i.e., $77,500 – $75,000 = $2,500). In a sense, by setting a price that approaches the toymaker's PV, the firm has attempted to claim for itself almost all of the value that has been created. Alternatively, if the firm sets a low price, say, $55,000, it would be offering almost all of the created value to the potential buyer, providing the buyer with a great incentive to transact, but providing little contribution to the firm. A price at some middle point, say, $65,000, would perhaps provide a reasonable incentive for both the firm and the potential buyer to transact.

Second, it is critical to recognize that the value of this air-filtration system likely varies across customers. Consider the owner of an off-shore oil rig who needs a similar system. While this owner faces the same two alternatives—the new product at a price yet to be determined or the next-best alternative at $75,000—the relative impact of his choice may be quite different from that faced by the toymaker. In particular, different operating conditions may affect the probability of a system crash, the cost of a system failure, and the system's operating costs per hour, as reflected in **Exhibit 5**.

EXHIBIT 5 Air-Filtration Alternatives for an Off-Shore Oil Rig

	New Product	Next-Best Alternative
Probability of system crash	2%	23%
Cost of system crash	$350,000	$350,000
Hours of operation	2,500	2,500
Operating system cost per hour	$18	$12
Price	To be determined	$75,000

Using the numbers from Exhibit 5, we can calculate the TEV for the oil rig owner as follows:

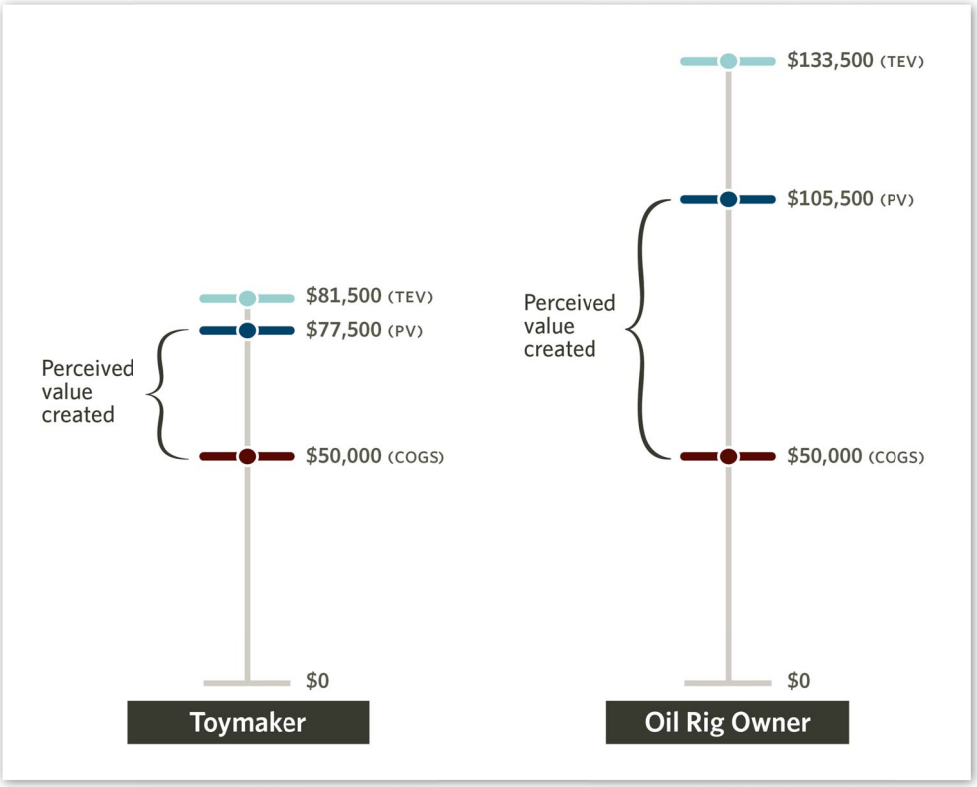
$$\begin{aligned}\text{TEV} &= \$75{,}000 + \big((23\% \cdot \$350{,}000) - (2\% \cdot \$350{,}000)\big) \\ &\quad - \big((2{,}500 \text{ hrs} \cdot \$18/\text{hr}) - (2{,}500 \text{ hrs} \cdot \$12/\text{hr})\big) \\ &= \$75{,}000 + \$73{,}500 - \$15{,}000 \\ &= \$133{,}500\end{aligned}$$

If we again assume that this potential buyer is not fully convinced that the new machine will actually reduce the probability of a system crash to 2% in a year but believes 10% to be more likely, we can assess the PV for this oil rig owner as follows:

$$\begin{aligned}\text{PV} &= \$75{,}000 + \Big(\big(23\% \cdot \$350{,}000\big) - \big(10\% \cdot \$350{,}000\big)\Big) \\ &\quad - \Big(\big(2{,}500 \text{ hrs} \cdot \$18/\text{hr}\big) - \big(2{,}500 \text{ hrs} \cdot \$12/\text{hr}\big)\Big) \\ &= \$75{,}000 + \$45{,}500 - \$15{,}000 \\ &= \$105{,}500\end{aligned}$$

As is immediately obvious, the resulting TEV and PV for our oil rig owner are significantly different from that of the toymaker because of the different conditions under which the air-filtration systems will perform. This is reflected in the value-pricing thermometers for each firm (see **Exhibit 6**).

EXHIBIT 6
Value-Pricing Thermometers for Toymaker Versus Oil Rig Owner



These pricing thermometer differences create both a potential problem and an opportunity. In particular, if we were to set a single price of $77,500 for the new product, we would simultaneously (1) provide little incentive for the toymaker to buy the new system and (2) leave a lot of money on the table when it comes to the oil rig owner. Therefore, the goal of an optimal pricing strategy should be to separate these two buyers, whenever possible, and price differentially to each. For instance, given that the toymaker and the oil rig owner operate in very different industries, how we price to one may not restrict how we price to the other. In particular, if the procurement of this air-filtration system is through a bidding process that

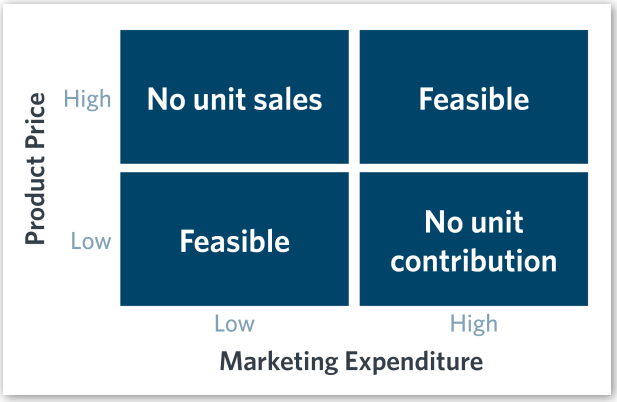
includes a request for proposal (RFP), the price charged to one buyer may have no impact on the price charged to the other buyers because the seller does not publish a price list. Alternatively, we may choose to differentiate our offerings physically, providing a standard-duty air-filtration system for buyers like our toymaker and a heavy-duty system for buyers like our off-shore oil rig owner. The point here is that some form of price customization—the ability to charge different prices to different segments—can be a vital part of pricing program profitability. We explore price customization more deeply later in this reading.

The third important concept to note is that a firm's price and marketing activities must work together. **Exhibit 7** shows the two feasible strategies with respect to pricing and marketing efforts.

The first feasible option, in the lower left, is to follow a low-price (relative to TEV) and low-marketing-expenditure strategy. The product's value in this case must speak for itself, and such a soft voice may not push PV near TEV. But because of the low price, the hurdle for a consumer to purchase may not be high. The second option is to follow Zantac's high/high strategy, in the upper right quadrant of the exhibit. In particular, a firm can invest in marketing to boost PV, price high to capture the perceived value thereby created, and attain the margins necessary to fund the high marketing effort.

Conversely, the other two price/expenditure combinations are not feasible in the long term. High price/low marketing, in the upper left quadrant, fails because the organization doesn't use enough resources to convince potential consumers of the product's value. And low price/high marketing, in the lower right quadrant, is not feasible because, while the high number of consumer purchases may help create unit sales, the low unit margins resulting from the low price amount to minimal contribution to the organization.

EXHIBIT 7 Setting Price and Marketing Efforts



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2.2 Price Customization

Thus far, we've reported on the positive impact of improved price realization on an organization's profits. Price customization, where price varies across customers, is the primary way that many organizations improve such price realization—with dramatic results. Service companies in particular have increased profitability significantly through ***dynamic pricing*** implemented through ***yield-management systems***. For example, the US rental car company Hertz has reported improved price realization of up to 5% after the adoption of yield-management practices.

What are some of the factors affecting how a company might customize prices? As we've already suggested, the TEV and PV of any given product can vary greatly across customers, whether the company operates in a ***business-to-consumer*** (***B2C***) or ***business-to-business*** (***B2B***) setting. A number of factors can drive these variations:

- *Tastes*. For example, one person may regard Lindt as the maker of the best-tasting chocolates in the world, while another may prefer a Nestlé bar.
- *Nature of use*. The manager who uses an Excel spreadsheet to track sales force compensation may value the software more highly than someone who uses Excel to track his league's soccer scores.
- *Intensity of use*. The picture quality of the latest Samsung television may be more highly valued by someone who watches hours of televised sports than by the person who glances at the news for a half hour each morning while getting ready for work.
- *Competition*. The value of a nonstop Lufthansa flight will be greater on routes where few (or no) other airlines fly nonstop than on routes where many do.

It is important to note that, given these and many other influences on the TEV and the PV of a product across customers, the idea that everyone should pay the same is almost always suboptimal for the firm. Indeed, examples of price customization are commonplace. Airlines, aided by sophisticated yield-management systems, vary prices based on the time of day, the day of the week, and overall availability of seats. Diners often get early-bird pricing specials if they arrive at a restaurant before 5 p.m. Seniors regularly receive discounts to the movies and on public transportation. The Boston Red Sox charge higher ticket prices for baseball games against their rivals, the New York Yankees, than for games against other opponents. And coupon users get discounts in grocery stores, while nonusers pay full price.

So how does an organization customize its prices for particular products? Fortunately, a number of tools are available to help organizations align prices with the value that specific customers or customer segments place on a product. For instance, a company can:

- *control the availability of prices* by selectively presenting an offer to a particular group of customers but not to others.
- *set the price based on buyer characteristics*, such as age, gender, location, or affiliation, when those characteristics correlate with the TEV and/or PV for an individual.
- *set the price based on transaction characteristics*, such as quantity purchased, time of purchase, or method of payment, when those characteristics correlate with the TEV and/or PV for an individual.
- *manage the product-line offering* such that the offered assortment provides increasing functionality at an increasing price, sometimes called a good/better/best strategy.

We discuss each of these methods in turn.

Controlling Availability

A firm controls the availability of prices by offering deals only to specific groups of buyers. For example, a firm can offer discounts according to a customer's visitation and purchasing history, by location, through coupon usage, or through information gathered via e-commerce.

An online retailer, for example, can track *visitation and purchasing history* to assess the relative ***price sensitivity*** of potential buyers. In doing so, it can offer a special deal to someone who seems interested in a particular good (as signaled by multiple online visits), but has not yet purchased (presumably because of price sensitivity). This tactic has long been used in the offline world of direct-mail catalogs. A catalog retailer might have a series of catalogs that it sends out to new customers, with the level of price incentives becoming increasingly more attractive with each mailing. If the potential buyer does not order at the regular price in the first catalog, she receives a second catalog with a modest promotional offer. If she still does not purchase, she receives a third catalog with a more substantial promotion, and so on.

Other companies control the availability of prices according to *location*. For instance, in recent years, a customer living in Denver, Colorado, could walk into a local grocery store and purchase discounted ski-lift tickets to several Rocky Mountain ski resorts. This purchase required some forethought and effort (a trip to the grocery store at some point before the trip into the mountains) and therefore tended to be made by more price-sensitive customers. In contrast, customers who were less price-sensitive would simply drive an hour or two to the ski resort, where they would buy a full-priced lift ticket. It is not uncommon for sports and entertainment venues to charge higher ticket prices at the venue than are available at more distant outlets. The marketing assumption is that if a person has committed herself to skiing at a particular mountain or attending a particular event by actually traveling to that mountain or event, her valuation of that good is likely to be greater than that of the person who has not yet left home and needs a financial incentive to do so.

Couponing is another means to control availability, with coupons often distributed only to those who meet certain criteria specified by a vendor. In the consumer packaged goods (CPG) arena, Catalina, a US-based digital solutions company, maintains more than 200 million individual purchase histories via customer loyalty cards. Using these histories, Catalina can distribute coupons to customers at checkout counters in local grocery stores, and the coupons are keyed to that day's transaction and to the customer's previous purchases. For example, a CPG company could engage Catalina to deliver a coupon for $0.50 to a very specific person or group, such as anyone who purchased the company's brand more than three times in the last 18 months, but not at all in the last three months. In this case, the price discount would be targeted to someone whose PV of the brand has apparently declined in the recent past.[10]

Finally, *e-commerce* currently represents about 7% of retail sales and can easily customize price using controlled availability. Vendors know a great deal about potential buyers based on previous search and purchase behavior and can change online prices instantly and at little cost. As described by a 2012 article in the *Wall Street Journal*, pricing on the Internet is "increasingly tailored and targeted."[11] The *Journal* studied the online pricing practices of the US office-supply retailer Staples, and found that it appeared to "be basing its online prices on its beliefs about the distance a customer needed to travel to a *rival* brick-and-mortar store." (Italics inserted for emphasis by authors.) The basic idea was that a potential online Staples' customer living near a brick-and-mortar competitor, such as Office Depot, had a good alternative and thus should see more attractive online prices.

Setting the Price Based on Buyer Characteristics

Observable consumer characteristics can also provide information about their likely valuation of a product. In March 2014, for example, a cruise line operating out of Fort Lauderdale, Florida, offered a 30% discount to Florida residents, presumably because Floridians had less need to escape their local weather than those suffering through a brutal winter in other parts of the country. Similarly, Walt Disney World in Orlando, Florida, sometimes offers discounts to those with proof of Florida residency, with a three-day pass priced as shown in **Exhibit 8** in April 2014.

EXHIBIT 8
Price Structure for Walt Disney World Three-Day Pass, April 2014

State Residency	Age	
	3–9 Years	10+ Years
Florida	$167	$179
Other	$255	$274

Source: Walt Disney World, "Tickets and Passes for Florida Residents," https://disneyworld.disney.go.com/florida-residents/, accessed April 21, 2014; Walt Disney World, "Theme Park Tickets," https://disneyworld.disney.go.com/tickets/, accessed April 21, 2014.

When selling their next-generation products, software vendors apply this pricing principle by offering a more attractive upgrade deal to customers who purchased a recent version of that same

software than to those who purchased an older version. The assumption is that people who purchased more recently would still be relatively satisfied with the versions they were using. For example, when FileMaker introduced FileMaker Pro 13 in 2013, it offered a "Regular Upgrade Price" of $179 to holders of FileMaker Pro 10, 11, or 12. But users of Pro 9 or earlier, for whom an upgrade to Pro 13 represented a significant increase in functionality, were encouraged to "purchase a full version [of 13] for $329."[12]

Common buyer characteristics used to sort potential customers include the following: age (with children and seniors often receiving discounts), residency (in-state versus out-of-state), user status (new versus existing), and nature of the buyer (individual versus company, end user versus reseller). In each of these cases, the goal is to choose a dimension that segments buyers into those who value a product more and those who value it less.

Setting the Price Based on Transaction Characteristics

Sometimes the particular characteristics of a transaction signal a customer's valuation of a product—namely, the *timing* of a purchase or the *quantity* of the item being purchased. Let's start with timing. When an airline ticket is purchased far in advance of actual travel, the buyer is more likely to be a leisure traveler with a somewhat flexible schedule, more likely to be paying out of his own pocket, and more likely to have the time to shop around for a good deal—all of which should *increase* price sensitivity. In contrast, the customer who purchases an airline ticket one week before travel is more likely to be traveling on business, more likely to be reimbursed by her company for that ticket, and more likely to be limited in her travel options—all of which should *decrease* price sensitivity. Not surprisingly, airlines respond accordingly, generally offering substantially lower prices for travelers who purchase their tickets far in advance of travel and substantially higher prices for travelers who purchase just prior to travel.

Other times, the *quantity* of an item being purchased signals the economic value of a product. For instance, for many buyers, the second unit of an item that is purchased is worth *less* than the initial unit purchased. Whereas a three-day pass to Disney World in the United States costs a Florida nonresident $274, a four-day pass costs $294—only $20 more. Similarly, in the United States, FileMaker Pro is heavily discounted as a function of the quantity purchased (see **Exhibit 9**).[13]

EXHIBIT 9 Price Structure for FileMaker Pro Software

Quantity in Order	5–24	25–49	50–99	100–249	250–499	500–999	1,000+
Discount Applied to FileMaker Pro Units	2%	9%	17%	24%	32%	40%	47%

Source: FileMaker, Inc., "FileMaker Licensing," www.filemaker.com/purchase/resellers/docs/fm_licensing_datasheet.pdf, accessed March 27, 2014. FileMaker is a trademark of FileMaker, Inc., registered in the United States and other countries.

The logic here is twofold. First, the greater the quantity purchased, the greater the incentive for the buyer to search for alternatives and/or to negotiate aggressively. Second, it is almost always the case that the marginal value of the fifth unit purchased is greater than the marginal value of the fiftieth unit purchased; for example, a firm will have some employees for whom access to a particular software program is critical to their job performance, while for others it is simply nice to have. As a result, the firm that purchases many units of a product generally is more price-sensitive (and thus in need of a discount) than the firm that buys one or two units of a product.

A firm can offer volume discounts in many ways. The most straightforward is through a posted discount schedule, such as that used by FileMaker. A second common tool is the two-

part pricing plan. Under two-part pricing, rather than post a single price (say, $300) for each and every unit of a good purchased, the seller presents an initial one-time fee (say, $1,000) coupled with a lower uniform price for each unit purchased (say, $200). The net result is that those customers who purchase in smaller quantities will pay a higher effective per-unit price than those who purchase in larger quantities. With the prices just given, for instance, the customer who purchases five units of a good will pay an effective price of $400 per unit ([$1000 + ($200 per unit · 5 units)] ÷ 5 units), while the customer who purchases 20 units will pay an effective price of $250 per unit ([$1000 + ($200 per unit · 20 units)] ÷ 20 units). Such a price customization mechanism can yield significant added profit for the firm. For example, a study done for the German railway system found that adopting a two-part pricing plan—with discounted rates for those purchasing an upfront annual membership fee—boosted firm profits by almost 50% compared with the optimal single-price plan.[14]

Managing the Product-Line Offering

Potential customers often vary in the level of functionality they need in a product. Thus, another tool used to customize price is to offer a product line in which price varies with functionality. For example, Acushnet, the maker of Titleist golf balls, knows that the weekend golfer only needs a golf ball that conforms to the rules of the game and works reasonably well, whereas the professional golfer needs the highest performing golf ball the firm can make. If Acushnet were to offer a single golf ball that met the needs of the professional golfer, it would be providing functionality that the recreational golfer does not need and is unwilling to pay for. This creates a pricing dilemma. Acushnet could set a high price for this single golf ball, but it then limits itself to those customers who are willing to pay for the highest functionality, with all others priced out of the market. Alternatively, it could set a low price for this single golf ball to attract the price-sensitive recreational golfer—but it would then give away much of the value it has created for the professional golfer.

Offering a line of golf balls that vary both in functionality and price should better meet the needs of this diverse customer base and thus be more profitable for Acushnet. Knowing this, Acushnet sells its highest quality Titleist Pro V1 golf ball for a suggested price of $62 per dozen and sells its lower quality Titleist DT Solo golf ball for $28 per dozen. In addition, its examination of the degree of price sensitivity in the market led Titleist to develop a four-price-point strategy, offering its NXT golf balls for $44 and its Velocity golf balls for $35, prices between those of the Pro V1 and the DT Solo.

Firms often refer to this basic approach to product-line assortment as a *good/better/best strategy,* with potential customers self-selecting among the alternatives based on their needs and on their ability and willingness to pay. In the process, a consumer gets the product that best meets his or her needs, and the seller benefits by capturing more of the value that it has created.

Price Customization and Perceived Fairness

When considering the strategies we outlined in this section, it is important to recognize that some buyers view price customization as unfair. While it should be obvious that no pricing method should cross legal barriers, it is also critical to note that price customization itself is both fair and legal. Part of proper pricing is to address this perception of fairness. For example, a one-price policy typically means that customers who value a product less are, in effect, subsidizing buyers who value it more. In other words, buyers with a relatively low valuation end up paying more for the good or service than they might under price customization, while those with a relatively high valuation end up paying less for the good than they might otherwise.

2.3 Setting the Price: Consideration of Customer Price Sensitivity

Until this point, we have presented the value-based approach to pricing and have argued for the benefits, both to consumers and the firm, of price customization. We also hope we have made clear the value of moving from a world of simple cost-plus pricing to one in which a customer's perceived value plays a key role.

While adopting a value-based philosophy is a necessary first step, effective pricing requires at least two additional details: an understanding of how consumers respond to changes in price, and an appreciation for how various price/quantity combinations affect the economics of the firm. In this section, we set out tools that are helpful for understanding customer price sensitivity. In the next section, we do the same for understanding the economic impact of pricing for the firm.

As the earlier discussion about the value-pricing thermometer revealed, the feasible zone for setting price is bound at the top by a customer's PV and at the bottom by a firm's COGS. Determining precisely where to set price within this zone is the next task. Ideally, a company can achieve short-term profit maximization by setting a price that approaches each customer's PV while still ensuring the transaction takes place. However, this is feasible only with perfect price discrimination—that is, the ability to customize price for each customer. In reality, the best many firms can do is to vary price by customer segments, assuming there is some systematic variation in PV across identifiable sets of customers. And in some cases, because of operational, information, or other limitations, a firm is forced to post a single price for all potential customers.

Regardless of an organization's flexibility when it comes to price customization, however, to set a price optimally, it must first assess customers' sensitivities to price—sometimes referred to as their willingness to pay. The two major approaches to this assessment are through managerial judgment and rigorous market research, with the two often used in concert with one another.

Assessing Price Sensitivity Using Managerial Judgment[15]

Who will be more price-sensitive—the grocery store shopper picking out menu items for a dinner party that includes her manager or the person picking out snack items for a picnic for his child's school class? What about a young couple buying a car seat for their first baby versus their next-door neighbors purchasing a snow shovel for the coming winter?

While we can collect data to address such questions, chances are you did not need much research to answer the two questions just posed. Why? Because managerial judgment has some validity when it comes to price sensitivity, especially when one has knowledge or experience in the product category.

Exhibit 10 summarizes twelve general qualitative indicators that managers can use to judge relative pricing sensitivity. Each indicator is grouped under the heading of *product, price,* or *buyer*. Before a company undertakes formal market research, managers should consider these three sets of indicators to understand the leeway each manager might have in managing price.

EXHIBIT 10 General Indicators of Customer Price Sensitivity

First consider the product indicators:

1 *Low differentiation of alternatives.* If there is little performance differentiation between alternatives, price is likely to be important. For example, given the commodity-like nature of home heating oil, price may be the critical decision variable when deciding between two reputable oil-delivery firms that service the same area.

2 *Easy comparability.* If all available options satisfy a customer's needs in much the same manner, it should be easy to compare alternatives, thus heightening price sensitivity. Consider a consumer's price sensitivity to brands of bottled water (e.g., Evian versus Dasani) relative to his or her price sensitivity for things to do on a Friday night (e.g., dinner at a restaurant versus going to a music concert). In general, the more a comparison involves similar alternatives (apples to apples), the greater a consumer's sensitivity to price.

3 *Will perform as expected.* To what degree do we know if a product will perform as advertised? When performance can be fully assessed before purchase, as with ***search goods,*** price sensitivity is likely to be high. When performance is harder to predict, as with ***experience goods,*** brand assurances become more important and price sensitivity typically is lower.

4 *Not mission-critical.* When the performance of a product is mission-critical, as in the case of the car seat for the new baby, price sensitivity will be depressed. But when performance is not mission-critical and a product's failure is more bothersome than significant, sensitivity to price should be higher.

Consider those indicators that fall under *price* in Exhibit 10:

5 *Easy comparability.* The ease with which prices can be compared heightens price sensitivity. Thus, we expect high price sensitivity for gas stations, which post prices in large numbers for all to see. At the other end are software vendors, whose pricing schemes range from outright sales to monthly leases and from price per system to price per module. In general, pricing complexity and variance across vendors should decrease price sensitivity.

6 *High in a relative sense.* In business-to-business settings, the greater the impact a product has on a firm's total costs, the more price-sensitive the buyer is likely to be. For instance, saving 10% on an item that represents 50% of the firm's costs reduces total costs by 5%, while saving the same percentage on an item that represents 10% of total costs reduces them by only 1%. For consumers, the same holds true, but the situation is relative to their budget or disposable income. Thus, one would expect greater price sensitivity for a consumer when he or she is shopping for a car than when shopping for a new coffee grinder for the kitchen.

7 *Reference prices exist.* Buyers often consider more than just the price of competitive alternatives.[16] For instance, buyers can compare the price of a product to the price they previously paid for that very same product, sometimes framing any increase in price as a painful loss. Alternatively, a buyer can assess pricing fairness by weighing the price against the apparent cost of goods sold. With pharmaceuticals and software, for instance, some buyers never factor in the cost to develop a new drug or a computer program and therefore are outraged by the seemingly high prices for items that apparently cost just pennies to make. Knowing this impact of reference prices, sellers often work hard to establish a recommended selling price, against which the actual price of a product compares favorably.

8 *Not needed as quality cue.* In some product categories, such as perfume or fine wines, inherent product quality is difficult to judge. In such cases, potential buyers often use price as an indicator of quality, thereby decreasing price sensitivity. In other cases, there is no such need for price as a cue to quality, which increases relative price sensitivity.

Finally, consider the indicators that fall under *buyer* in Exhibit 10:

9 *Sophisticated, deliberative.* In many business-to-business situations, the buyers in the organization are highly trained. They study alternatives, become knowledgeable about options, and learn to navigate the complexities of price. In addition, they seek to gain buyer power by bundling purchases together. All of this heightens price sensitivity. In consumer markets, a similar phenomenon can exist as some invest time and energy in becoming category experts. They pride themselves in getting a good deal, and are more price sensitive than nonexperts in the category.

10 *Bearing costs.* The more a decision maker bears the cost of a purchase, the greater is her or his sensitivity to price. Thus, the doctor who prescribes a drug is likely to be less sensitive to the price of that drug than the patient who pays some or all of its cost. In turn, the patient whose drugs are covered mostly by health insurance should be less sensitive to price than the patient who pays the entire price out-of-pocket.

11 *Able to switch easily.* Sometimes, buyers become locked in to a particular product, either due to preferences or to habit. For instance, years of experience with a software product make it difficult to switch to a competing product that offers similar functionality but with a slightly different interface, but would give the consumer some price flexibility. Similarly, the consumer who drinks only Diet Coke will pay higher average prices than the consumer who willingly switches between Diet Coke and Diet Pepsi, depending on which is on sale. In situations where economic or psychological stickiness is not operative, however, price sensitivity is higher.

12 *Not motivated by prestige.* For some individuals, a high price lends an air of exclusivity to a product or brand by virtue of its being priced beyond the reach of others. To the extent that a buyer does not fall prey to this prestige phenomenon, price sensitivity will be higher.

None of these general indicators is a perfect predictor across all situations. And some will be relevant in one setting, and others will be relevant in another. Collectively, however, a qualitative assessment of these indicators by managers is useful in thinking about and actually setting price. Nonetheless, rigorous market research, as we describe next, should complement these qualitative assessments.

Assessing Price Sensitivity Using Quantitative Market Research

Managerial judgment can be complemented greatly by a quantitative assessment of the impact of pricing on demand. Three commonly used market research procedures for assessing price sensitivity are (1) customer surveys, (2) price experimentation, and (3) analysis of historic pricing and sales data.

The first of these, customer surveys, runs the gamut in terms of sophistication. In the simplest of customer surveys, a firm selects a representative set of customers and asks about their willingness to pay for a planned, new, or existing product. Representative questions asked in this context include the following:

- What is the likelihood that you would buy this product at a price of $25.00?
- At what price would you definitely buy this product?
- How much would you be willing to pay for this product?
- How much of this product would you buy at a price of $0.99?
- At which price difference would you switch from product A to product B?

For example, a camera manufacturer might use this type of approach as input to setting the price for a new point-and-shoot digital camera. Typically, an organization would provide a description of the new camera and ask survey respondents to indicate their purchase intention on a seven-point scale, from "Definitely not buy" to "Definitely would buy." One-third of the respondents might be told the camera cost $120; one-third, $180; and one-third, $250. The results of this hypothetical survey are shown in **Exhibit 11**.

EXHIBIT 11 Survey Responses to Different Proposed Camera Prices

		Definitely Not Buy		Probably Not Buy		Probably Would Buy		Definitely Would Buy
Survey Scale		1	2	3	4	5	6	7
Stated Price of Camera	**$120**	11%	16%	12%	14%	20%	17%	10%
	$180	34%	22%	14%	12%	10%	6%	2%
	$250	46%	20%	13%	10%	7%	3%	1%

Source: Adapted and reprinted from "Principles of Pricing," HBS No. 506-021 by Robert J. Dolan and John T. Gourville. Copyright © 2005 by the President and Fellows of Harvard College; all rights reserved.

In interpreting results of this kind, focus is often put on those answering "probably would buy" or higher—that is, 47% at the $120 price point, 18% at $180, and 11% at $250. Armed with this potential sales information and knowledge of their costs, the organization's managers could then decide on a camera price, such as $119.95, that maximizes the sales outcome of greatest interest to the firm (e.g., revenue, profit, or unit sales).

Note that direct response surveys do have potential problems. For instance, such surveys can induce an unrealistically high level of price consciousness for a consumer. On the other hand, consumers are only *asked* about their willingness to buy or to pay and they are not actually required to spend their money, so the survey results often paint an overly optimistic picture of a product's potential. Nevertheless, such surveys are often a good first step in assessing perceived value. In addition, sophisticated survey approaches, such as conjoint analysis, can mix price and product comparisons to address these problems.

In contrast to a survey that asks customers to predict how they would behave, ***price experimentation*** observes how customers actually do behave relative to price. This observation can take place in a simulated environment, such as a test store where products are presented at various prices, or in the actual marketplace, where prices are manipulated across time or geographic locations. One popular method, called A/B testing, exposes one group (group A) to one price and a second group (group B) to another, with any differential purchasing behavior across the two groups being attributed to price. Note that this process involves setting a price for the express purpose of learning price sensitivity, even to the point of setting prices far from levels believed to be profit maximizing. For example, GOG.com, the computer game maker, explicitly announced a pricing experiment in which it changed the prices of some games to $3.99 and others to $6.99 "to see if this brings us and our partners more money overall, even though there is less per individual sale."[17]

An analysis of historic prices provides a third way to assess price sensitivity quantitatively. In contrast to the proactive use of pricing experiments, firms often have years of historic pricing data at their disposal. For instance, as a firm pursues its (often changing) marketing goals, prices for a product tend to vary over time and across geographic regions, creating something akin to a natural experiment. And with advances in scanner-based tracking technology, information firms such as Nielsen and IRI increasingly track prices, sales, and market share at a region, store, or even household level, providing the data needed to determine the effect of price on overall consumer demand using sophisticated mathematical models.

Mapping the Relationship Between Price and Demand[18]

The knowledge gained from these qualitative and quantitative tools is often pulled together to map the likely demand for a product at various price points. The relationship between price and demand is captured graphically by a ***demand curve***,[c] which plots the cumulative aggregate demand for a firm's product across all consumers at a wide range of price points. In its most basic form, it is linear and its slope is calculated as follows:

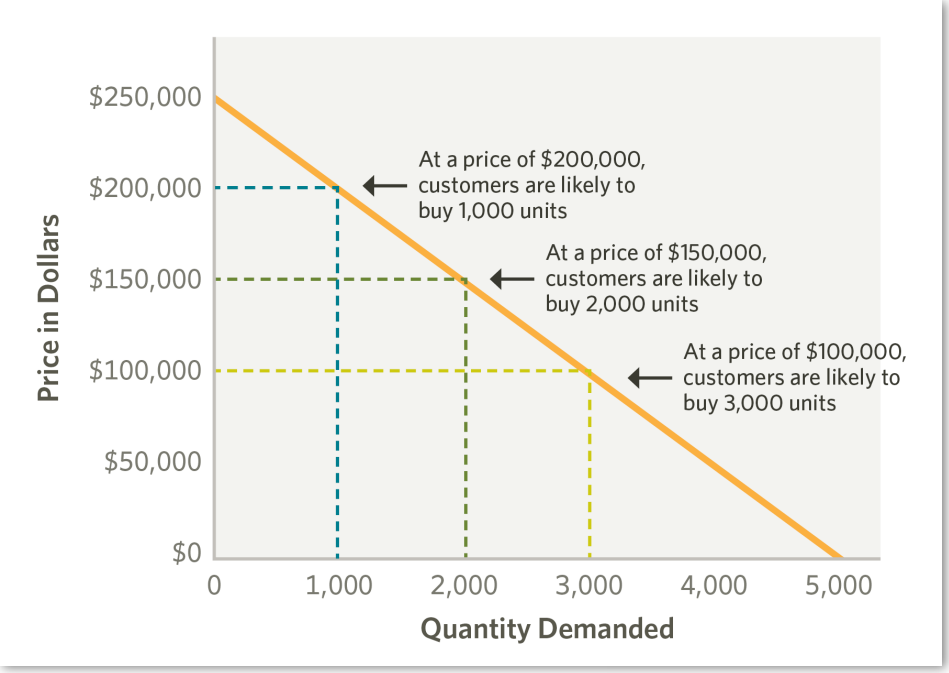
$$\text{slope of the demand curve} = \frac{\text{change in price}}{\text{change in quantity demanded}}$$

Consider the demand curve for a firm that sells concert grand pianos, which is shown in **Exhibit 12**. The point at which the demand curve crosses the vertical axis indicates the price above which no customer will buy the firm's product because it is too expensive. If the firm prices the product at this point, it will sell zero units. At a price of $250,000, for instance, demand for this firm's concert grand pianos appears to dry up completely, perhaps because they are too expensive relative to the pianos offered by its competitors. Similarly, the point at which the demand curve crosses the horizontal axis indicates the maximum number of units

[c] A demand curve can also be developed at the industry level, which captures how overall demand varies at different industry-level price points, or at the firm level, which captures how demand for that firm's products varies at different firm-level price points, with all other firms holding prices stable.

the firm could sell if it offered the product for free. In our example, it appears that only 5,000 people would want a 9-foot-long, 2,000-pound concert grand piano, even if it were free. Points on the demand curve between these two extremes capture the probable demand for a firm's product at specific price points—for example, 1,000 pianos at $200,000, 2,000 pianos at $150,000, 3,000 pianos at $100,000, and so on.

EXHIBIT 12 Demand Curve for a Firm's Concert Grand Pianos



Source: Adapted and reprinted from "Marketing Analysis Toolkit: Pricing and Profitability Analysis," HBS No. 511-028 by Thomas Steenburgh and Jill Avery. Copyright © 2010 by the President and Fellows of Harvard College; all rights reserved.

Note that a demand curve is only a prediction of what will happen at various price points and is most often informed by how demand has varied relative to price in the past. As such, a manager may be far more willing to trust its predictions for price ranges that are typically observed in the marketplace than for price ranges that are rarely or never seen in the marketplace. If concert grand pianos typically range in price from $50,000 to $125,000, for instance, the demand curve is more likely to predict demand accurately at $100,000 than at $200,000. In addition, while a linear demand curve theoretically captures what will happen to demand as we charge extremely high prices (e.g., $250,000) or extremely low prices (e.g., $0), these portions of the curve may not be meaningful to a manager because a firm is unlikely either to price itself out of the market or to offer its product at highly unprofitable prices. Again, it is the middle part of the demand curve that is usually most relevant for marketing managers.

Price Elasticity of Demand

One of the great values in capturing the likely aggregate demand for a product at various price points is the resulting understanding of how responsive, or elastic, consumers' demand for a product is to a change of price. Economists refer to this as the *price elasticity of demand,* written as *E,* and it is captured mathematically as follows:

$$\text{price elasticity of demand} = \frac{\%\ \text{change in quantity demanded}}{\%\ \text{change in price}}$$

where

$$\%\ \text{change in quantity demanded} = \frac{\text{new quantity} - \text{old quantity}}{\text{old quantity}}$$

$$\%\ \text{change in price} = \frac{\text{new price} - \text{old price}}{\text{old price}}$$

The price elasticity of demand measures the percentage change in quantity demanded by consumers as the result of a percentage change in price. Note that this formula usually results in a negative number, but that the negative sign is traditionally ignored because it is the magnitude of the number that is of interest.

Returning to our piano example, the demand curve suggests that we will sell 1,000 pianos when we price them at $200,000, but that quantity demanded will increase to 1,500 pianos if we lower the price to $175,000. *For this part of the demand curve*, the resulting elasticity is:

$$\text{price elasticity of demand} = \frac{\frac{1{,}500 - 1{,}000}{1{,}000}}{\frac{\$175{,}000 - \$200{,}000}{\$200{,}000}} = -4.0$$

How should we interpret an elasticity of −4.0 (or 4.0, if we ignore the negative sign)? Essentially, it is telling us that within this particular price range, $175,000 to $200,000, a small percentage change in price will lead to a relatively large percentage change in quantity demanded. Specifically, a 1% decrease in price will lead to a 4% increase in quantity. As seen in **Exhibit 13**, this is typically referred to as elastic demand.

EXHIBIT 13 Price Elasticity of Demand

Elasticity Ratio	Type of Elasticity	Description
$E = \infty$	Perfectly elastic	Any very small change in price results in a very large change in quantity demanded.
$1 < E < \infty$	Relatively elastic	Small changes in price cause large changes in quantity demanded.
$E = 1$	Unit elastic	Any change in price is matched by an equal change in quantity.
$0 < E < 1$	Relatively inelastic	Large changes in price cause small changes in quantity demanded.
$E = 0$	Perfectly inelastic	Quantity demanded does not change when price is changed.

Source: Reprinted from "Marketing Analysis Toolkit: Pricing and Profitability Analysis," HBS No. 511-028 by Thomas Steenburgh and Jill Avery. Copyright © 2010 by the President and Fellows of Harvard College; all rights reserved.

It is important to note, however, that the price elasticity of demand will vary along a linear demand curve. While the price elasticity of demand is 4.0 in the $175,000 to $200,000 price range of our example, it is far different at lower price points. For instance, the demand curve suggests that lowering the price of concert grand pianos from $75,000 to $50,000 will increase demand from 3,500 to 4,000 pianos. Using the same mathematical formula, this will result in an elasticity of −0.43 (or 0.43 if we ignore the minus sign). In other words, the 33% drop in price will only result in a 14.3% increase in demand. This is typically referred to as inelastic demand, as reflected in Exhibit 13.

Why Elasticity Matters

The price elasticity of demand should be of great interest to marketing managers. Under relatively elastic demand conditions, price sensitivity is high and quantity demanded should be very responsive to small changes in price. For example, when the price elasticity of demand is 2.0, a 10% decrease in price leads to a 20% increase in the quantity demanded. In contrast, under relatively inelastic demand, the opposite is true—price sensitivity is low and the quantity demanded does not vary greatly with price.

Consider two small and relatively isolated towns: Town A has four gas stations in close proximity to one another, while Town B has but a single gas station. Each gas station in Town A should see highly elastic demand, with sales significantly greater at the gas station that posts the lowest price (even if by just a few pennies) and significantly lower at the gas station that posts the highest prices (again, even if by just a few cents). In contrast, the lone gas station in Town B should see highly inelastic demand (because there are no other alternatives available), with little change in overall demand, even with relatively large increases or decreases in price.

Ultimately, a firm needs to understand the relative price sensitivity of its target customers if it is to set prices effectively. This understanding can come through managerial judgment or through quantitative market research. It can also come in the form of a categorical assessment of price sensitivity (low versus high) or as a number (−4.0 versus −0.5) that reflects the target market's price elasticity of demand. Regardless of source and form, however, understanding relative price sensitivity is critical.

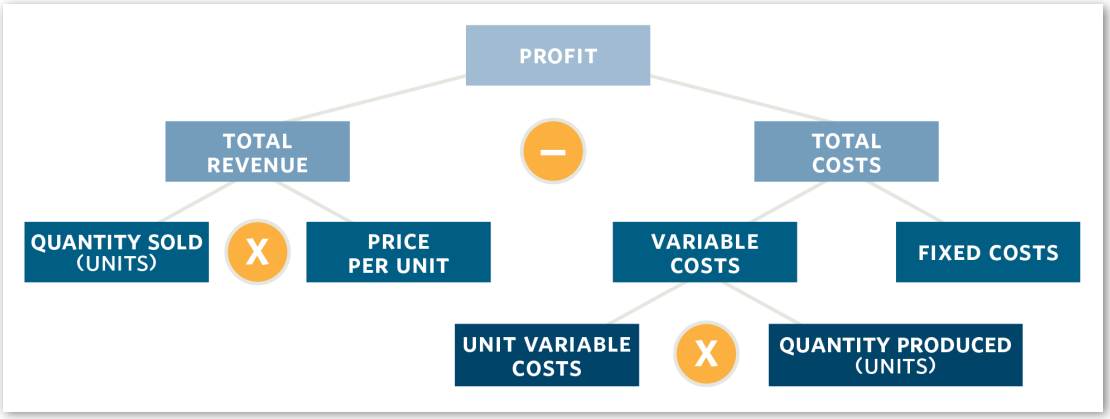
2.4 Setting the Price: Understanding the Economic Impact for the Firm

In addition to assessing the price sensitivity of customers, managers must understand the economic implications of pricing for the firm, with profit often being the overarching objective. Quite simply, profit is the difference between the *total revenue* generated and the *total costs* incurred in making and selling the product.

The Drivers of Profitability

The basic elements of product profitability are shown in **Exhibit 14**; these elements are profit, total revenue, total costs, quantity sold, price per unit, variable costs, fixed costs, unit variable costs, and quantity produced. We will look at each of these in turn.

EXHIBIT 14 Basic Elements of Product Profitability



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Total Revenue

The first component of the profit calculation is total revenue—that is, the amount of money coming into the firm from the sale of the product. It is based on the total number of units, or quantity, sold to customers and the price at which each unit is sold:

$$\text{total revenue} = \text{price per unit} \cdot \text{quantity sold}$$

If all units are sold at the same price, for example, one merely needs to multiply the quantity sold by that price. Thus, if Dell sells 1,000 units of a particular laptop computer for $500 each, the total revenue generated is $500,000. If the 1,000 units are sold at different prices, perhaps because of effective price customization, the math is more complex, but the basic logic remains the same.

For firms that sell directly to consumers, the price used in the total revenue calculation is the retail price at which the consumer purchases the product. For firms that do not sell directly to consumers but rather to a channel intermediary, such as to a wholesaler or retailer, the price used in the calculation is the wholesale price at which the firms sell their products to that channel partner.

Total Costs

The second component of the profit calculation involves the cost to produce the products being sold. In this regard, there are two types of costs typically incurred by a firm—fixed costs and variable costs.

Fixed costs remain constant, regardless of the amount of a product produced and sold. These costs could include expenses such as rent for administrative office space, management salaries, and advertising. In the short term, such costs remain constant, regardless of whether the factory is running at 50% or 90% of capacity—that is, they remain fixed.

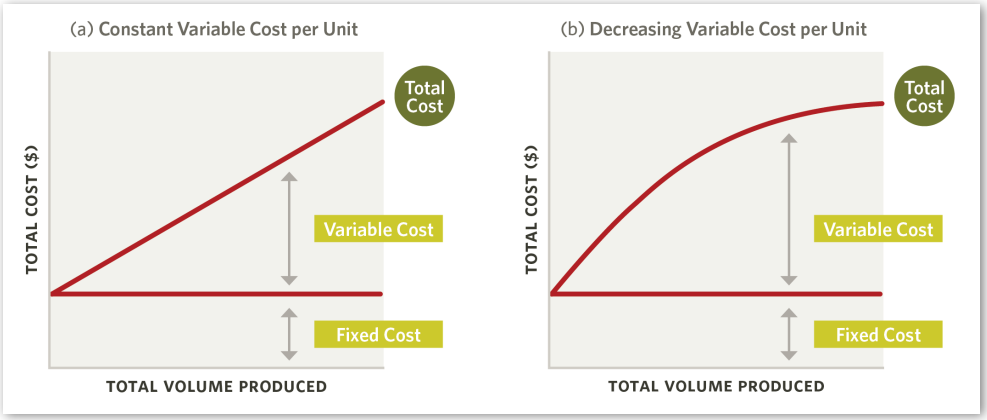
In contrast, variable costs change depending on the amount of product produced and sold. For a manufacturing firm, these costs include the costs of raw materials and direct manufacturing labor. For instance, if the materials used to make a clock included a movement for $10, a housing for $5, a dial and hands for $3, and a glass front for $2, and the labor required to assemble that clock amounted to one-quarter of an hour for a worker earning $20 per hour, the unit variable cost to make a single clock is $25 ($20 in materials + $5 in labor). In turn, if the firm were to produce 10 clocks at a constant unit variable cost, the total variable cost for those 10 clocks would be $250.[19]

Combining fixed and variable costs, total costs measure the amount of money a firm must spend to produce the quantity of goods it makes and sells. In its simplest form, total costs are calculated as follows:

$$\text{total costs} = \text{fixed costs} + \left(\text{unit variable costs} \cdot \text{quantity produced}\right)$$

Exhibit 15 shows these costs graphically. In the base case, where the unit variable cost remains constant across the number of units produced, total costs can be captured as reflected in Exhibit 15(a). Here, the fixed costs are shown as a flat line, reflecting the fact that fixed costs do not vary in the number of units produced. In turn, the total cost line, which is the sum of the fixed costs and total variable cost, is an angled straight line, reflecting the fact that total variable costs increase at a constant rate with increases in volume.

EXHIBIT 15 Constant Versus Decreasing Variable Costs



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In contrast, unit variable costs often vary depending on the number of units produced, as reflected in Exhibit 15(b). This could happen for a number of reasons—for example, the firm achieves some economies of scale in the production process or it negotiates some volume discounts for raw materials. As a result, fixed cost is shown as a flat line, but now the shape of the total cost curve is concave—that is, it increases at a decreasing rate with volume. This means the unit variable costs decrease the more the firm produces.

Regardless of whether total cost takes the simpler shape of Exhibit 15(a) or the more complex shape of Exhibit 15(b), the basic concept is the same. That is, one needs to add the fixed and variable costs incurred by the firm to produce a product to arrive at the total costs used to assess profitability.

Unit Margins

The profitability framework just outlined is relevant in the aggregate—that is, it enables the firm to assess the profit of selling x units of a good for y dollars each, when it incurs fixed costs of w and unit variable costs of z.

However, almost any pricing discussion also considers the financial contribution of a single unit of a good. We call the difference between the per-unit revenue received by a firm and the per-unit variable cost of production the *unit margin*. If it is clear from the context, we sometimes drop the word *unit* and simply call this the *margin*. Another term sometimes used to represent the same quantity is *unit contribution*.

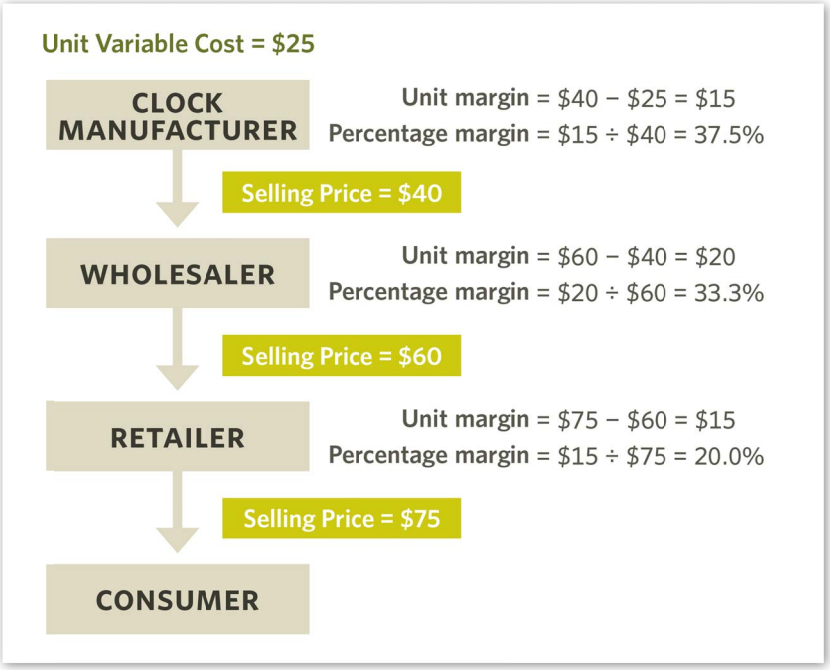
Consider our clockmaker. If the firm sells this clock to its nearest downstream channel partner, say a wholesaler, for $40 and the unit variable cost, as previously stated, is $25, then the unit margin is $15. Sometimes, it is useful to state this $15 unit margin in percentage terms. To do so, you simply divide the dollar margin by the selling price (e.g., $15/$40 = 0.375) and multiply by 100 to arrive at a percentage margin of 37.5%.[d]

Sometimes, we extend this analysis to the entire channel of distribution. For example, **Exhibit 16** shows the channel structure used to bring this clock to market. In this channel, it costs the manufacturer $25 to produce the clock. In turn, it sells the clock to the wholesaler for $40, who sells it to a retailer for $60, who sells it to a consumer looking for a housewarming

[d] When it comes to percentage margins, it is important not to confuse margin with markup. Percentage margin is always communicated and calculated as unit margin divided by selling price. In our example, $15/$40 = 0.375, meaning that 37.5% of the selling price is margin. Markup refers to the unit margin relative to the unit variable cost, or $15/$25 = 0.60. In other words, the price of the clock has been marked up 60% relative to its unit variable cost.

gift for $75. For each of these entities, we can calculate the unit and percentage margin for the selling of this clock.

EXHIBIT 16 Prices, Costs, and Margins in the Channel of Distribution



In this example, the manufacturer, wholesaler, and retailer each perform a set of channel functions, and each partner in the channel system is compensated for those functions by the margin it receives. Here, the manufacturer receives a 37.5% margin; the wholesaler, a 33.3% margin; and the retailer, a 20% margin. Such an analysis is useful to understand the relative motivation of each channel partner to sell a product. Alternatively, if we analyze the margins of channel partners across competing products, we might better understand why a particular channel partner is promoting one firm's products more than those of another firm.

Breakeven Analysis

Fixed costs, variable costs, and unit margin can be used in a number of ways to assist a manager in setting price. A useful simple calculation is a ***breakeven analysis*** in which a manager calculates how many product units must be sold at a given price to cover the company's fixed costs. The so-called breakeven volume (BEV) is defined as follows:

$$\text{BEV} = \frac{\text{fixed costs}}{\text{revenue per unit} - \text{variable cost per unit}} = \frac{\text{fixed costs}}{\text{unit margin}}$$

Let us return to our clockmaker, who now must incur fixed costs of $1.2 million to produce and sell the clock. These fixed costs might cover the fee paid to a designer to configure the clock, the special tooling required to make its movement and hands, and the development of promotional materials used to advertise it. These costs are fixed because they will not change with the number of clocks sold. Given the $15 unit margin the clockmaker will receive for each clock sold, he will cover his $1.2 million in fixed costs if he sells the following number of units:

$$\text{BEV} = \frac{\$1{,}200{,}000}{\$15/\text{unit}} = 80{,}000 \text{ units}$$

In other words, if this clockmaker sells 80,000 units of this particular clock over the lifetime of the operation, he will fully recover the $1.2 million in fixed costs he invested in production and selling. If he sells fewer than 80,000 units, he will lose money. And if he sells more than 80,000 units, he will turn a profit.

The Impact of a Price Change

In addition to this basic BEV assessment, one can construct a number of informative what-if scenarios. Suppose our clockmaker is worried about current demand for clocks and has concerns about his firm's marketing capabilities, calling into question his ability to sell 80,000 units at a price of $40. What would be the implication of raising the price to $50, thus increasing the unit margin to $25? Using the BEV formula, the clockmaker would find that breakeven sales would decline to 48,000 units:

$$\text{BEV} = \frac{\$1{,}200{,}000}{\$25/\text{unit}} = 48{,}000 \text{ units}$$

Thus, the clockmaker could assess whether he was better off trying to sell 80,000 clocks at $40 or 48,000 clocks at $50, and price accordingly.

The Impact of a Change to Fixed Costs

Breakeven analysis can also be used to assess how sales volume would need to change to justify other potential investments. For instance, consider the possibility of keeping the price at $40, but having a noted TV personality endorse the clock for a fee of $90,000. This would change the BEV from the 80,000 units in the original scenario as follows:

$$\text{BEV} = \frac{(\$1{,}200{,}000 + \$90{,}000)}{\$15/\text{unit}} = \frac{\$1{,}290{,}000}{\$15/\text{unit}} = 86{,}000 \text{ units}$$

In other words, if the endorsement leads to incremental sales of 6,000 units, the clockmaker would break even. If the endorsement leads to incremental sales of greater than 6,000, it would increase the clockmaker's profits.

The Impact of a Change to Variable Costs

Breakeven analyses can also be used to examine the impact of a potential change to the variable cost of producing a good. Imagine that our clockmaker could switch from a rather plain $5 painted clock housing to a more attractive $8 polished teak housing, thereby increasing the variable cost of the clock from $25 to $28 and decreasing the unit margin from $15 to $12. How much would sales need to increase to compensate for the extra cost? Such a change in costs for the higher-grade finish would change the BEV as follows:

$$\text{BEV} = \frac{\$1{,}200{,}000}{\$12/\text{unit}} = 100{,}000 \text{ units}$$

Thus, the switch to a polished teak housing would make sense if the clockmaker thought it would result in incremental sales of at least 20,000 units.

To see the breakeven formula in practice, click on **Interactive Illustration 2**. Using the sliders, enter a hypothetical revenue per unit (r), variable cost per unit (v), and total fixed costs

(*C*). The graph will display the output required to fully cover the firm's fixed costs in that scenario—i.e., the breakeven volume. Using the sliders, see what happens when output rises above or falls below that breakeven volume. How does a change in total fixed costs (*C*) affect the breakeven point? What happens when the variable cost per unit (*v*) approaches revenue per unit (*r*)? Why?

INTERACTIVE ILLUSTRATION 2 Breakeven Analysis

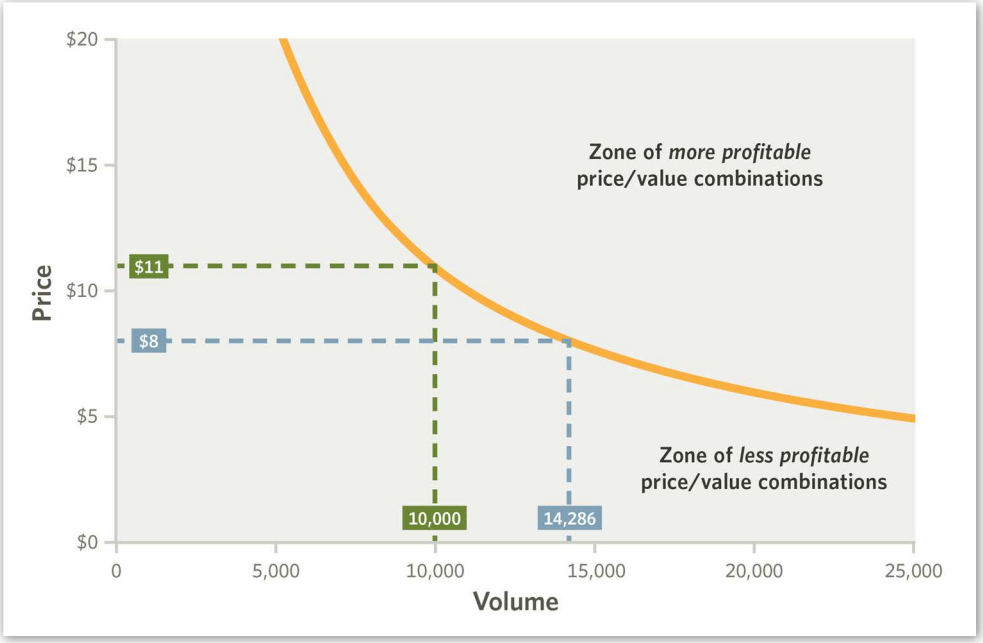
Scan this QR code, click the image, or use this link to access the interactive illustration: bit.ly/hbsp2pI88ZF

Iso-Profit Curves

An analytic tool that is conceptually related to breakeven analysis can be used to consider the advisability of one price point versus another. With an iso-profit curve, one can plot combinations of price and volume that lead to the same level of profitability. For example, consider a manager who recommends a retail price of $11 for an item with a per-unit cost of $1. This manager believes this $11 price point would generate sales of 10,000 units per year, resulting in an annual contribution of $100,000—that is, 10,000 · ($11−$1). But a second manager thinks customers will balk at paying $11 for an item that costs so little to make. He believes customers would be more receptive to a retail price of $8, thereby generating greater unit sales. Any resulting debate between these two managers would be made more productive with the aid of the iso-profit curve shown in **Exhibit 17**.

The iso-profit curve in Exhibit 17 captures the combinations of price and quantity that generate a $100,000 contribution, with all points below the curve producing a lower contribution for the firm and all points above the curve producing a higher contribution. This iso-profit curve shows that reducing the retail price from $11 to $8 would have to be accompanied by a 42.9% increase in unit sales to result in the same $100,000 contribution.

EXHIBIT 17
Iso-Profit Curve of Prices/Volumes Generating $100,000 in Contributions



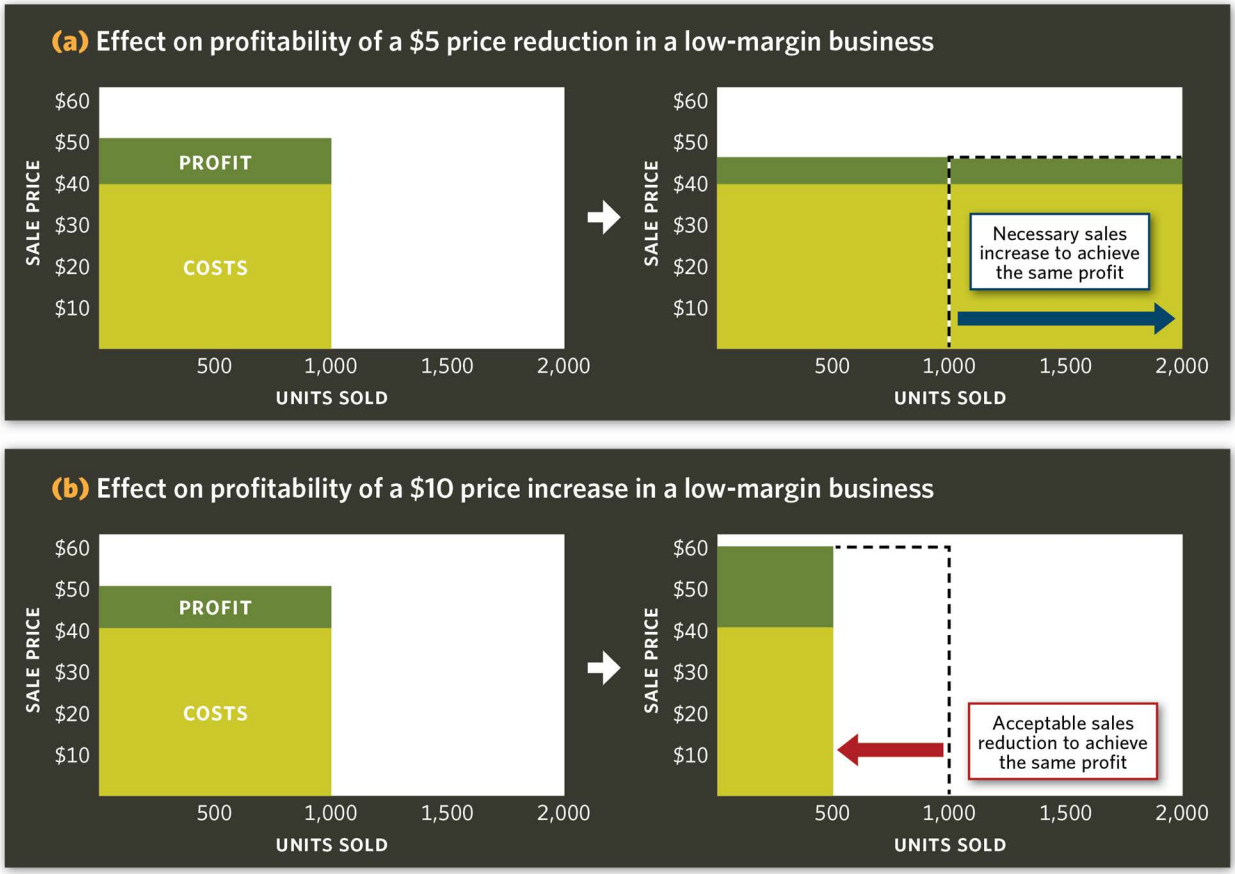
Marginal Math[20]

A final tool that managers can use to assess the financial impact of any pricing decision on the firm involves ***marginal math***—an analysis of the profitability of a price change based on the relative size of the unit margin.[e] Consider the decisions of a firm that is currently selling a product for $50. The product has a relatively low margin of 20%, or $10, as shown in **Exhibit 18(a)**. If this firm is currently selling 1,000 units of its product, it is generating $50,000 in revenue and $10,000 in profit. From a profitability perspective, would this firm be better off lowering price to spur demand or increasing price to increase per unit margin?

Using marginal math, one discovers that cutting price by a modest 10% (to $45) would halve the per-unit margin on this product (to $5). To compensate, sales would need to double to 2,000 units to maintain profitability, as reflected in the right side of Exhibit 18(a). Conversely, modestly increasing price by 20% (to $60) would increase the per-unit margin by 100% (to $20), and sales could be halved before the firm experiences a negative impact on profits, as can be seen in Exhibit 18(b). To determine the likelihood of either of these outcomes—i.e., the doubling of sales with a 10% price decrease or the halving of sales with a 20% price increase—a manager can draw on her or his understanding of the price elasticity of demand inherent in the marketplace. As discussed previously, if demand is highly elastic, a doubling of sales with a small price change (or a halving of sales with a small price increase) may be realistic. If demand is anything other than highly elastic, however, the price cut will almost certainly decrease profitability significantly, while the price increase will almost certainly increase profitability significantly.

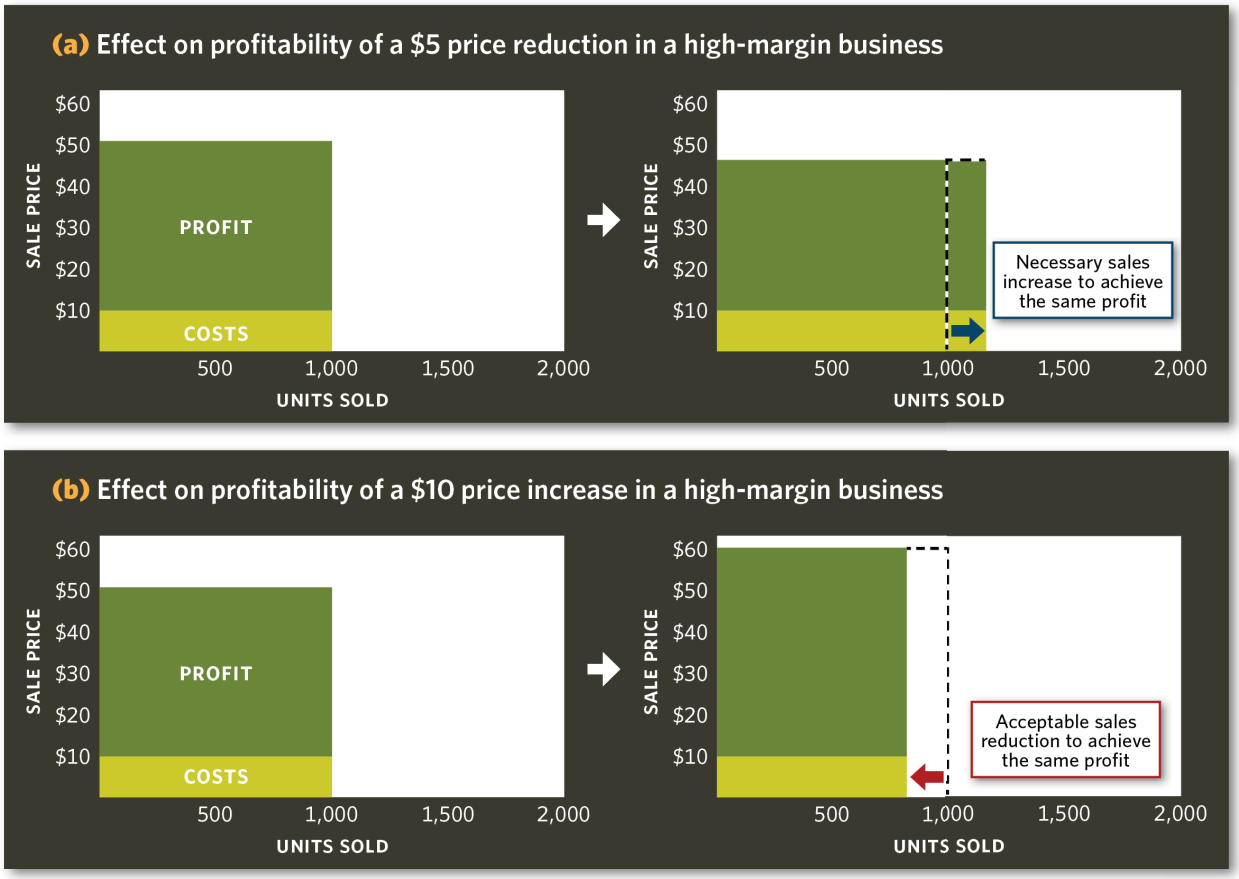
[e] The iso-profit curve can be considered a special case of marginal math.

EXHIBIT 18
The Effect of a Change in Price on Profitability for Low-Margin Businesses



How do things change for a firm that operates in a business with higher unit margins available? See **Exhibit 19** for an example. Let's say that a pharmaceutical firm sells 1,000 units of a $50 drug that has a margin of 80%, or $40, thereby generating $50,000 in revenue and $40,000 in profits. What would be the impact on profit of the very same 10% price cut or a 20% price increase? In the case of the former, the unit margin would drop only 12.5%, from $40 to $35, thereby requiring only a small increase in unit sales to maintain profitability, as reflected in Exhibit 19(a). And in the latter case, the unit margin would increase by 25%, from $40 to $50, allowing for only a 20% decline in unit sales before profitability would suffer, as seen in Exhibit 19(b).

EXHIBIT 19
The Effect of a Change in Price on Profitability for High-Margin Businesses

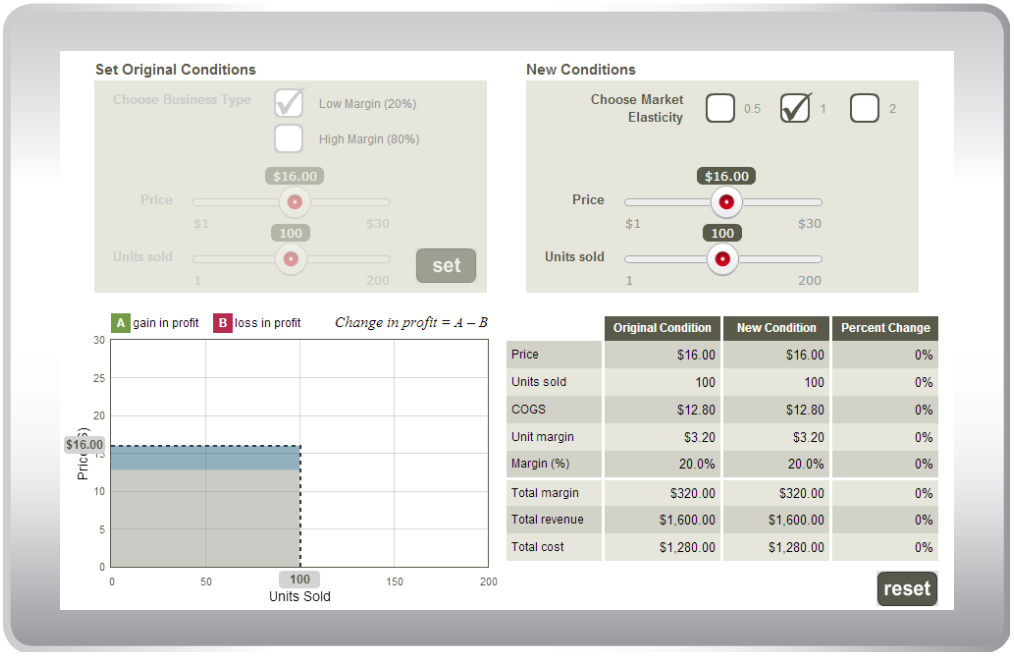


To determine the likelihood of either of these outcomes, a manager can look to the market's price elasticity. In contrast to the lower-margin business, however, even small changes in demand can have significant effects on profitability when margins are higher. Thus, the optimal pricing decision in any industry is driven both by the price elasticity of demand in the marketplace and by the relative size of the margins inherent in that industry. What constitutes an optimal pricing decision in a lower-margin business, such as the retail packaged goods industries (e.g., grocery stores) may be quite different from an optimal pricing decision in a higher-margin industry.

To better understand marginal math and the interplay among price, margin, unit sales, and price elasticity, see **Interactive Illustration 3.** Start with a low-margin business, and set a starting price and units of output for your hypothetical product. After clicking "set," choose an elasticity of demand for your product (0.5, 1.0, or 2.0). Then make changes to the price of your product. How do units of output change? What happens to revenues, costs, and profits? What does the graphical display to the left tell you about why profitability increases or decreases? Now try a different elasticity and compare the market's reaction. Reset the interactive illustration to try the exercise with a high-margin business. How do your results change? What conclusions can you draw about the effect of price changes in low- versus high-margin businesses? What conclusions can you draw regarding differences in price elasticity of demand?

INTERACTIVE ILLUSTRATION 3 Marginal Math

Scan this QR code, click the image, or use this link to access the interactive illustration: bit.ly/hbsp2GhnNWd



As noted at the outset, setting an accurate price can mean a great deal to the bottom line of any firm. At the same time, pricing is the area that most frustrates many marketing managers, leaving them with the uneasy feeling that they are not executing as well as they should be.

This reading has provided a framework for addressing these concerns and provides the three key inputs to effective pricing. The first is a value-based approach to pricing—looking at the value a product provides a customer, as opposed to the costs that a firm incurs to offer that product. The second is a clear understanding of the price sensitivity in the marketplace, ideally at the level of individual consumers, but more realistically at the level of distinct customer segments. And the third is a clear appreciation for the economic impact of the pricing decision for the firm.

3 KEY TERMS

breakeven analysis An analysis to determine the sales volume required to cover fixed and variable costs fully. Profit at the breakeven sales volume is zero.

business-to-business (B2B) A financial transaction, such as a sale, that takes place between businesses, such as between a manufacturer and wholesaler or between a wholesaler and a retailer.

business-to-consumer (B2C) A financial transaction, such as a sale, that takes place between a company and consumers who are the end users of a product.

cost-oriented pricing An approach to pricing in which the posted price is based on the cost of producing a product, plus some additional margin for the firm to realize a return. In the simplest version, called cost-plus pricing, a firm typically adds a percentage to the costs of production to arrive at the posted price.

demand curve In economics, a graphic representation of the relationship between product price and the quantity of the product demanded. It is drawn with price on the vertical axis of the graph and quantity demanded on the horizontal axis.

dynamic pricing An approach to pricing in which the posted price varies according to the current level of market demand.

experience good A product or service in which product characteristics, such as quality or price, are difficult to observe in advance, but can be ascertained upon consumption. Philip Nelson originated this concept.

marginal math A conceptual tool used to assess the change in unit sales required to maintain profitability in light of a change in product price (which in turn changes the unit margin).

price experimentation The purposeful setting of price at varying levels across time, across geographic regions, and/or across channels to assess consumer response to the various prices.

price sensitivity The degree to which an individual's willingness to purchase changes with a change in price.

search good A product or service with features and characteristics easily evaluated before purchase. Search goods are more subject to substitution and price competition than experience goods. Philip Nelson originated this concept.

value-based pricing An approach to pricing in which the posted price is based on the value of a product as perceived by the customer.

yield-management system An approach to pricing in which the posted price is based on the expected demand for a given product by various customers. Typically applied to a perishable product, such as an airline seat or a hotel room, prices are adjusted by customer type, by the timing of the purchase, and/or by the date and time the product will be used.

4 FOR FURTHER READING

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5 ENDNOTES

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3 Elliot B. Ross, "Making Money with Proactive Pricing," *Harvard Business Review* 62 (November/December 1984): 145–155.

4 Robert J. Dolan and Hermann Simon, *Power Pricing: How Managing Price Transforms the Bottom Line* (New York: The Free Press, 1996), pp. 324, 335–336.

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6 Thomas T. Nagle, John E. Hogan, and Joseph Zale, *The Strategy and Tactics of Pricing: A Guide to Growing More Profitably*, 5th ed. (Upper Saddle River, NJ: Prentice Hall, 2011), p. 14, emphasis ours.

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9 John T. Gourville, "The Medicines Company," HBS No. 502-006 (Boston: Harvard Business School, 2001).

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11 Jennifer Valentino-DeVries, Jeremy Singer-Vine, and Ashkan Soltani, "Websites Vary Prices, Deals Based on Users' Information," *Wall Street Journal*, December 24, 2012.

12 FileMaker, Inc., "FileMaker Store," https://store.filemaker.com/US/ENG/RTL/product/purchase/, accessed March 7, 2014.

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18 Much of the discussion on elasticity is adapted and reprinted from "Marketing Analysis Toolkit: Pricing and Profitability Analysis," HBS No. 511-028 by Thomas Steenburgh and Jill Avery. Copyright © 2010 by the President and Fellows of Harvard College; all rights reserved.

19 This scenario has been adapted from "Pricing: Design and Implementation," HBS No. 500-020 by Samuel Chun. Copyright © 1999 by the President and Fellows of Harvard College; all rights reserved.

20 For a more in-depth treatment of marginal math, see Stephen J. Hoch, Xavier Drèze, and Mary. E. Purk, "EDLP, Hi-Lo, and Margin Arithmetic," *Journal of Marketing* 58 (October 1994): 16–27.

6 INDEX