

## LECTURE NOTES

### CHAPTER OPENING EXAMPLE

#### WHERE DOT-COM STILL THRIVES: HELPING YOU TO SAVE TIME AND MONEY

##### A. Growing Aviation Market in Asia

- Powered by 3.4 billion people, the Asia-Pacific region is set to become the largest regional aviation market in the next three years.
- Recent years reported 30 percent increase in outbound leisure air travel and a 6.4 percent regional growth and increase in aircraft purchases are predicted through year 2025.
- Major carriers in Asia are Singapore Airlines, Cathay Pacific and other China and Middle East carriers.
- A total of US\$5.25 billion was invested in hotel developments in Asia countries in 2006.
- Asia travel industry is expected to grow with the rising affluence and a more tech-savvy generation. Online travel agency such as ZUJI (zuji.com) is gaining market awareness in this business.

##### B. How ZUJI works

- Online travel booking services with a series of regional offices and websites to almost any destination in the world.
- ZUJI focuses on travel value; supported by travel package, flight and hotel deals.
- It offers services from 400 airlines, 40,000 hotels and 4,000 activities and car rental choices.
- ZUJI continues to beat the dot-com odds by providing two key benefits to customers:
  - a. Saving time:* user friendliness makes internet travel reservations easy, often saving much time and misunderstanding
  - b. Saving money:* customers can achieve substantial price savings buying tickets online than through travel agents

### C. Travel Dot-Com Prices: A Win-Win for Both Buyers and Sellers

- Benefits of travel dot-com:
  - a. For customers: save time and money
  - b. For airlines and hotels: extra money received by airlines and hotels to offset expenses incurred when they sell their services through travel agents or own channels (agents or website)
- Pricing decisions involve carefully assessing consumer demand, revenues, fixed costs, and variable costs before setting a final price.
- Price is unique among all marketing and operations factors. It is the place where all other business decisions come together.
  - a. Customers must be willing to pay it.
  - b. It must generate enough sales dollars to develop, produce, and market a product while earning a profit for the company.
  - c. Small changes in price can have big effects on both the number of units sold and company profit: a 1 percent price increase translates to a 10 percent profit hike for a product with 10 percent profit margin.

## I. NATURE AND IMPORTANCE OF PRICE [LO1]

The price paid for goods and services goes by many names: *tuition, rent, interest, premiums, fees, dues, fares* and sometimes a *price*.

### A. What Is a Price?

- From a marketing viewpoint, **price** is the money or other considerations (including other goods and services) exchanged for the ownership or use of a good or service.
- **Barter** is the practice of exchanging goods and services for other goods and services rather than for money, and accounts for billions of dollars annually in domestic and international trade.
- The amount paid for a good or service is not always the same as the list, or quoted, price because of discounts, allowances, and extra fees.
- Buyers are more willing to pay extra fees (surcharges and special fees) than a higher list price, so sellers use add on charges as a way of having the consumer pay more without raising the list price.

- All the different factors that increase or decrease the price are put together in a “price equation,” as shown in Figure 13-1:

$$\text{Final price} = \text{List price} - (\text{Incentives} + \text{Allowances}) + \text{Extra fees}$$

- The price equation for a Lexus LS Hybrid 08 model results in a final price of \$115,840!

### **B. Price as an Indicator of Value**

- Price is often used to indicate value when it is compared with the perceived benefits of a product or service.
- Specifically, **value** is the ratio of perceived benefits to price:

$$\text{Value} = \frac{\text{Perceived Benefits}}{\text{Price}}$$

- a. For a given price, as perceived benefits increase, value increases.
  - b. Conversely, for a given price, as value decreases, perceived benefits decrease.
- Creative marketers engage in **value-pricing**, the practice of simultaneously increasing product and service benefits while maintaining or decreasing price.
    - a. In a survey, buyers, 84 percent agreed with the statement: “The higher the price, the higher the quality.”
    - b. Value involves a consumer’s judgment by regarding the worth and desirability of a product or service relative to substitutes that satisfy the same need.
    - c. A “reference value” involves comparing the costs and benefits of substitute items.
    - d. The value of “supersizing” means getting a larger quantity for about the same price.

### **C. Price in the Marketing Mix**

- Pricing has a direct effect on a firm’s profits, whose **profit equation** is:

$$\begin{aligned} \text{Profit} &= \text{Total Revenue} - \text{Total Cost} \\ &= (\text{Unit Price} \times \text{Quantity Sold}) - \text{Total Cost} \end{aligned}$$

- The six major steps involved in the process of setting prices are:

1. Identify pricing constraints and objectives.
2. Estimate demand and revenue.
3. Determine cost, volume, and profit relationships.
4. Select an approximate price level.
5. Set list or quoted price.
6. Make special adjustments to list or quoted price.

[NOTE: The first three steps are covered in this chapter and the last three in Chapter 14.]

## **II. STEP 1: IDENTIFY PRICING OBJECTIVES AND CONSTRAINTS [LO2]**

A marketing manager must consider the pricing objectives and constraints that will narrow the range of choices. While pricing objectives frequently reflect corporate goals, pricing constraints often relate to conditions existing in the marketplace.

### **A. Identifying Pricing Objectives**

**Pricing objectives** involve specifying the role of price in an organization's marketing and strategic plans.

- Pricing objectives are carried to lower levels in the organization, such as in setting objectives for marketing managers responsible for an individual brand.
  - Pricing objectives may change depending on the financial position of the firm, the success of its products, or the segments with which it is doing business.
  - An organization may pursue six broad objectives, which tie in directly to the organization's pricing policies.
1. **Profit.** Three different objectives relate to a firm's profit, usually measured in terms of return on investment (ROI) or return on assets (ROA), which have different implications for pricing strategy:
    - a. *Managing for long-run profits* objective.
      - A firm gives up immediate profit in exchange for achieving a higher market share by developing quality products to penetrate competitive markets.
      - Products are priced relatively low compared to their cost to develop, but the firm expects to make greater profits later due to its high market share.

- b. *Maximizing current profit* objective, such as for a quarter or year, is common in many firms because the targets can be set and performance measured quickly. American firms are sometimes criticized for this short-run orientation.
- c. *Target return* objective occurs when a firm sets a profit goal (such as 20 percent for pretax ROI).
- d. To generate profits in today's global marketplace, international firms look around the world to find both new markets to increase revenues and suppliers whose efficiencies and lower hourly wages can reduce their manufacturing and other costs.

## MARKETING MATTERS

### **How Flattening the World Affects Both Revenues and Costs: Infosys Technologies, Ltd., Intel, China Mobile, IKEA...and You!**

*The New York Times* writer Tom Friedman the title for his book *The World Is Flat* on a trip to "India's Silicon Valley" in Bangalore, India. Friedman wanted to learn more about today's sources of wealth—information technology, call centers, and efficient manufacturing.

In visiting Infosys Technologies, Ltd., Friedman saw that outsourcing was just one of the fundamental changes impacting world business. Another was the realization that Internet connectivity and PCs allow anyone to do remote software development—intellectual work that can be delivered from anywhere, which often lowers costs and thereby "leveling the playing field" in global business. Other examples cited: Intel, China Mobile, and Swedish retailer IKEA.

#### **2. Sales.**

- a. Another objective may be to increase sales revenue, which in turn will lead to increases in market share and profit.
- b. Pricing objectives related to sales revenue or unit sales have the advantage of being translated easily into meaningful targets for marketing managers.
- c. Cutting price on one product in a firm's line may increase its sales revenue but reduce those of related products.

#### **3. Market Share.**

- a. Market share is the ratio of the firm's sales revenues or unit sales to those of the industry (competitors plus the firm itself).
- b. Companies often pursue a market share objective when industry sales are relatively flat or declining.

4. **Unit volume** is the quantity produced or sold.
  - a. Firms often sell multiple products at very different prices and need to match the unit volume demanded by customers with price and production capacity.
  - b. Using unit volume as an objective can be counterproductive if a volume objective is achieved by drastic price-cutting that drives down profit.
5. **Survival.** At times, profits, sales, and market share are less important objectives than mere survival. Specialty retailers increasingly are facing survival problems because they can't match price cuts by big discount retailers like Wal-Mart and Carrefour.
6. **Social Responsibility.** A firm may forgo higher profit on sales and follow a pricing objective that recognizes its obligations to customers and society in general.

#### **B. Identifying Pricing Constraints**

- **Pricing constraints** are factors that limit the range of prices a firm may set.
  - Other constraints on price vary from factors within the organization to those factors outside the organization (competitive, legal, and regulatory/legal).
1. **Demand for the Product Class, Product, and Brand.**
    - a. The number of potential buyers for the product class (cars), product (sports cars), and brand (Ferrari) affects the price a seller can charge.
    - b. Generally, the greater the demand for a product, the higher the price that can be set.
  2. **Newness of the Product: Stage in the Product Life Cycle.**
    - a. The newer a product and the earlier it is in its life cycle, the higher is the price that can usually be charged.
    - b. The high initial price is possible because of patents and limited competition early in its product life cycle.
    - c. Sometimes—when nostalgia or fad factors come into play—prices may rise later in the product's life cycle, such as with collectibles. But these items can take a nosedive too.
    - d. Publishing competitive prices on the Internet for the same or similar brands of products has revolutionized access to price comparisons for both collectors and buyers of more traditional products.

**3. Single Product versus a Product Line.**

- a. A firm has great latitude in setting a price for a lone, introductory product.
- b. With a wide range of products, the price of individual items must be consistent with the others based on features provided, and meaningful price differentials must communicate value to consumers.

**4. Cost of Producing and Marketing the Product.** In the long run, a firm's price must cover all the costs of producing and marketing a product. If the price doesn't cover these costs, the firm will fail; therefore, a firm's costs set a floor under its price.

**5. Cost of Changing Prices and Time Period They Apply.**

- a. Some firms can change prices for their products to reflect its latest information because only one buyer has to be informed.
- b. For catalog firms, if it decides that its product prices are too low after they have been mailed to customers, it must consider the cost of changing prices and the time period for which they apply in developing the catalog's price list.
- c. Changing prices can be costly, affecting both revenues and net margins. This is why many firms change the prices of their major products once a year. However, prices on a website can change from minute to minute.

**6. Type of Competitive Markets.**

- a. The seller's price is constrained by the type of market in which it competes, which dramatically influences the range of price competition and, in turn, the nature of product differentiation and extent of advertising it uses.
- b. Economists delineate four types of competitive markets:
  - *Pure monopoly.* Utilities are the most natural monopolies because their operations require immense infrastructure. There is no price competition. One seller sets the price for a unique product.
  - *Oligopoly.* The few sellers try to avoid price competition because it can lead to disastrous price wars in which all lose money. Firms stay aware of a competitor's price cuts or increases and may follow suit. The products can be undifferentiated (petroleum) or differentiated (cell phone services), and informative advertising that avoids head-to-head price competition is used.
  - *Monopolistic competition.* Many sellers compete on both price and nonprice factors (product features and advertising).

- *Pure competition.* Many sellers follow the market price for identical, commodity products. Advertising only informs buyers that the seller's product is available.
7. **Competitors' Prices.** A firm must know or anticipate what specific price its present and potential competitors are charging now or will charge.

## LEARNING REVIEW

1. **What factors impact the list price to determine the final price?**

Answer: discounts, allowances, rebates, and extra fees or surcharges

2. **What is the difference between pricing objectives and pricing constraints?**

Answer: Pricing objectives involve specifying the role of price in an organization's marketing and strategic plans whereas pricing constraints are factors that limit the range of prices a firm may set.

3. **How does the type of competitive market a firm is in affect its range in setting price?**

Answer: In a market characterized by pure competition, the marketplace determines the price an individual firm can set. In a market characterized by monopolistic competition, there is some price competition among firms, which allows an individual firm to set a price within a range of prices. In an oligopoly, a firm may either be a price leader and set the market price that other firms follow or be a price follower and set a price based on the prices set by its competitors to avoid a price war. In a pure monopoly, the firm, being the only one in the market, can set any price it wants.

## III. STEP 2: ESTIMATE DEMAND AND REVENUE [LO3]

Marketing executives must also translate this estimate of customer demand into estimates of revenues the firm expects to receive.

### A. Fundamentals of Estimating Demand

- How much would consumers be willing to pay for a product? If the price kept going up, at some point they will quit buying it. Conversely, if the price kept going down, they would buy more.
- An important question for marketing managers is: How much more of a product needs to be sold to make up for the lower price per unit? The answer depends on its demand curve.



### 1. The Demand Curve.

- a. A **demand curve** is a graph relating the quantity sold and price, which shows the maximum number of units that will be sold at a given price.
- b. Demand curve  $D_1$  in Figure 13–5A shows the demand for *Newsweek* under existing conditions. Note that as price falls, more people decide to buy and unit sales increase.
- c. There are three other factors to consider when estimating demand.
  - *Consumer tastes*. These include culture, demographics, and technology, which can change quickly.
  - *Price and availability of similar products*. As the price of substitutes (*Time*) fall or their availability increases, the demand for a product (*Newsweek*) will fall.
  - *Consumer income*. As real consumer income increases, allowing for inflation, demand for a product also increases.
  - The first two factors influences what consumers *want* to buy, and the third affects what they *can* buy.
- d. Along with price, these are called **demand factors**, or those that determine consumers' willingness and ability to pay for goods and services.
- e. It is difficult to estimate demand for new products because consumer likes and dislikes are difficult to read clearly.

### 2. Movement Along versus Shift of a Demand Curve.

- a. *Movement along a demand curve* occurs when the price is lowered and quantity demanded increases, assuming that other demand factors (consumer tastes, price and availability of substitutes, and consumer income) remain unchanged.
- b. If some of these factors do change (such as an increase of advertising or more extensive distribution, or if consumer incomes rise), a *shift in the demand curve* results. This means that more of a product is wanted (*Newsweek*) for a given price—the demand curve shifts to the right from  $D_1$  to  $D_2$ , as shown in Figure 13-5B.

### B. Fundamentals of Estimating Revenue

- Instead of “demand curves,” marketers speak in terms of “revenues generated,” which are the monies received by the firm for selling its products.
- Three revenue concepts lead to pricing decisions:

- a. **Total revenue (TR)** is the total money received from the sale of a product. Total revenue (TR) equals the unit price (P) times the quantity sold (Q) or  $TR = P \times Q$ .
- b. **Average revenue (AR)** is the average amount of money received for selling one unit of a product, or simply the price of that unit. Average revenue is the total revenue divided by the quantity sold or  $AR = (TR \div Q) = P$ .
- c. **Marginal revenue (MR)** is the change in total revenue that results from producing and marketing one additional unit. Marginal revenue (MR) equals the change in total revenue divided by a 1 unit increase in quantity or  $MR = \Delta TR \div \Delta Q$ , which equals the slope of the TR curve.

### 1. Demand Curves and Revenue.

- a. Figure 13–7A shows the demand curve for *Newsweek*, but it is now extended to intersect both the price and quantity axes.
- b. The demand curve shows that as price is changed (higher or lower), the quantity of *Newsweek* sold throughout the U.S. changes (less or more).
- c. Two important points about demand curves:
  - It can be dangerous to extend a demand curve beyond the range of prices for which it really applies.
  - Most demand curves are rounded (or convex) to the origin, thereby avoiding an unrealistic picture of what demand looks like when a straight-line curve intersects either the price axis or the quantity axis.
- d. Figure 13–7B shows the total revenue curve for *Newsweek* calculated from the demand curve shown in Figure 13–7A. The total revenue curve is developed by simply multiplying the unit price times the quantity for each of the points on the demand curve.
  - Total revenue starts at \$0 (point A), reaches a maximum of US\$6,750,000 at point D, and returns to \$0 at point G.
  - This shows that as price is reduced in the A-to-D segment of the curve, total revenue is increased.
  - Cutting price in the D-to-G segment results in a decline in total revenue.
- e. Marginal revenue, which is the slope of the total revenue curve, is positive but decreasing when the price lies in the range from US\$3.00 to above US\$1.50 per unit. Below US\$1.50 per unit, marginal revenue is actually

negative, so the extra quantity of magazines sold is more than offset by the decrease in the price per unit.

- f. For any downward-sloping, straight-line demand curve, the marginal revenue curve always falls at a rate twice as fast as the demand curve.
- In Figure 13–7A, the marginal revenue becomes US\$0 per unit at a quantity sold of 4.5 million units—the very point at which total revenue is maximized (Figure 13–7B).
  - Marketers would never operate in the region of the demand curve in which marginal revenue is negative. This means that in Figure 13–7A, prices would be set only in the A-to-D segment of the demand curve.
  - When market share falls, the easy answer is to cut price, often with devastating results, since a 1 percent decline in prices could lead to a significant decline in profits, other factors being equal.
- h. Ultimately, *Newsweek* kept the price at US\$2.00. However, through expanded newsstand distribution and more aggressive advertising, *Newsweek* was later able to shift its demand curve to the right and charge a price of \$2.50 without affecting its newsstand volume.

## MARKETING MATTERS

### **The Airbus versus Boeing Face-Off—How Many Can We Sell and at What Price...in a \$2.7 Trillion Market?**

Boeing and Airbus—fierce competitors and the only manufacturers of huge commercial jetliners today—agree that the size of the market for commercial jetliners over the next two decades will be \$2.7 trillion! This represents about 25,000 new aircraft seating 100 or more passengers.

#### **The Products**

Their main entrants in this market are Boeing’s 787 Dreamliner and Airbus’s A350XWB. Boeing’s jetliner will seat 210 to 330 passengers with the Airbus design seating 275 to 350. Each will fly about 8,500 nautical miles slightly under the speed of sound with quiet, fuel-efficient engines. The Boeing Dreamliner starts flying in 2008; the Airbus A350XWB in 2013.

#### **Marketing and Pricing**

To help simplify their buying decisions, both Airbus and Boeing have huge showrooms where potential customers can consider different seats, entertainment options, and electronically controlled windows. The showrooms also discourage airlines from “over-customization,” which can add extra costs and even delay deliveries. And the prices? About \$300 million each—plus or minus a few million—depending on customization decisions and

special quantity discounts.

## Demand

How many will be sold? By late 2007 Boeing had 710 orders for its 787 Dreamliner and Airbus had 228 orders for its A350XWB, only a fraction of what they need to break even. Time will tell whether Boeing or Airbus read their customers' needs better.

### 2. Price Elasticity of Demand. [LO4]

- a. With a downward-sloping demand curve, marketers are interested in how sensitive consumer demand and the firm's revenues are to changes in the product's price.
- b. This is measured by **price elasticity of demand**, the percentage change in quantity demanded relative to a percentage change in price.

$$E = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

- c. Because quantity demanded usually decreases as price increases, price elasticity of demand is usually a negative number. However, for simplicity and by convention, elasticity figures are shown as positive numbers.
- d. Price elasticity of demand assumes three forms: elastic demand, inelastic demand, and unitary demand:
  - *Elastic demand* exists when a 1 percent decrease in price produces more than a 1 percent increase in quantity demanded, thereby actually increasing sales revenue. This results in a price elasticity that is greater than 1. Marketers may cut price to increase consumer demand, the units sold, and total revenue for one of these products, depending on what competitors' prices are.
  - *Inelastic demand* exists when a 1 percent decrease in price produces less than a 1 percent increase in quantity demanded, which actually decreases sales revenue. This results in a price elasticity that is less than 1.
    - A product with inelastic demand means that slight increases or decreases in price will not significantly affect the demand, or units sold, for the product.
    - The concern for marketers is that while lowering price will increase the quantity sold, revenues will actually fall.
  - *Unitary demand* exists when the percentage change in price is identical to the percentage change in quantity demanded so that sales revenue remains the same. In this instance, price elasticity is equal to 1.

- Price elasticity of demand is determined by a number of factors:
  - a. The more substitutes a product or service has, the more elastic it is.
  - b. Products and services considered necessities are priced inelastic.
  - c. Items that require a large cash outlay compared with a person's disposable income are price elastic.
  - d. Because 12- to 17-year-olds often have limited "spending money," this group is very price elastic in its demand for cigarettes.
- Many legislators recommend higher excise taxes on cigarettes to increase their prices significantly with the goal of reducing teenage smoking.
- Thus, price elasticity is also important for public policy.

***[SLN 13-1: Teenage Smoking: Cool, Price Elasticity, and \$1-a-Pack Cigarettes!]***

**LEARNING REVIEW**

**4. What is the difference between a movement along and a shift of a demand curve?**

Answer: A movement along a demand curve occurs when the price is lowered and the quantity demanded increases (and vice versa), assuming that other factors remain unchanged. However, if these factors change, then the demand curve will shift.

**5. What is total revenue and how is it calculated?**

Answer: Total revenue (TR) is the total money received from the sale of product. Total revenue (TR) equals the unit price (P) times the quantity sold (Q) or  $TR = P \times Q$ .

**6. What does it mean if a product has a price elasticity of demand that is greater than 1?**

Answer: Elasticities greater than 1 indicate the product is price elastic.

#### **IV. DETERMINE COST, VOLUME, AND PROFIT RELATIONSHIPS [LO5]**

- While revenues are the monies received by the firm from selling its products or services to customers, costs or expenses are the monies the firm pays out to its employees and suppliers.
- Marketers often use marginal analysis and break-even analysis to relate revenues and costs.

##### **A. The Importance of Controlling Costs**

Five cost concepts are important in pricing decisions:

- **Total cost (TC)** is the total expense incurred by a firm in producing and marketing a product. Total cost is the sum of fixed cost and variable cost, or  $TC = FC + VC$ .
- **Fixed cost (FC)** is the sum of the expenses of the firm that are stable and do not change with the quantity of a product that is produced and sold. Examples of fixed costs are rent on the building, executive salaries, and insurance.
- **Variable cost (VC)** is the sum of the expenses of the firm that vary directly with the quantity of a product that is produced and sold. Examples are the direct labor and direct materials used in producing the product and the sales commissions that are tied directly to the quantity sold.  $TC = FC + VC$ .
- **Unit variable cost (UVC)** is variable cost expressed on a per unit basis, or  $UVC = VC \div Q$ .
- **Marginal cost (MC)** is the change in total cost that results from producing and marketing one additional unit of a product. Marginal cost (MC) equals the change in total cost divided by a 1 unit increase in quantity or  $MC = \Delta TC \div \Delta Q$ , which equals the slope of the TC curve.
- Many firms go bankrupt because their costs get out of control, causing their total costs to exceed their total revenues over an extended period of time. Therefore, marketers make pricing decisions that balance both their revenues and costs.

#### **MARKETING MATTERS**

##### **Pricing Lessons from the Dot-Coms—Understand Revenues and Expenses**

Price, revenue, fixed cost, variable cost. Boring? They are critical to marketing success, as shown by the lessons learned by the successful dot-coms so far.

**Brick-and-Mortar Dot-Com Failures.** Reasons for dot-com failures, including many brick-and-mortar businesses like [Pets.com](http://Pets.com) and Webvan:

- Setting prices too low to cover the huge brick-and-mortar fixed costs of inventory, warehouses, and order fulfillment.
- Spending too much on promotion, such as Super Bowl ads.
- Believing people would forgo shopping at traditional stores.

**Travel Dot-Com Successes (So Far).** Besides time and money savings for customers, travel dot-coms have special strategies for success:

- Reaching key customer segments that will actually pay higher prices for hotel rooms or airline tickets.
- Reaching customer segments whose last-minute or last-week flexibility enables them to reserve hotel rooms or airline seats that would otherwise go unsold.
- Conducting almost all operations electronically, without the warehousing and order fulfillment problems of bricks and mortar businesses.

## B. Marginal Analysis and Profit Maximization

- **Marginal analysis** is a continuing, concise trade-off of incremental costs against incremental revenues.
- For marketers, as long as revenue received from the sale of an additional product (marginal revenue) is greater than the additional cost of producing and selling it (marginal cost), a firm will expand its output of that product.

## C. Break-Even Analysis [LO6]

Marketing managers often employ an approach that considers cost, volume, and profit relationships based on the profit equation.

- **Break-even analysis** is a technique that analyzes the relationship between total revenue and total cost to determine profitability at various levels of output.
- The **break-even point (BEP)** is the quantity at which total revenue and total cost are equal. Profit then comes from all units sold beyond the BEP.
- In terms of definitions in Figure 13-8, the break-even point (BEP) is calculated as:

$$\text{BEP}_{\text{Quantity}} = \frac{\text{Fixed Cost}}{\text{Unit Price} - \text{Unit Variable Cost}} = \frac{\text{FC}}{\text{P} - \text{UVC}}$$

### 1. Calculating a Break-Even Point.

- a. Using the small picture frame store example in the text, a BEP quantity for the number of pictures needed to be sold to cover fixed costs can be calculated. If FC = \$28,000, P = \$100, and UVC = \$30, the BEP is:

$$\begin{aligned} \text{BEP}_{\text{Quantity}} &= \frac{\text{Fixed Cost}}{\text{Unit Price} - \text{Unit Variable Cost}} = \frac{\text{FC}}{\text{P} - \text{UVC}} \\ &= \frac{\$28,000}{\$100 - \$30} \\ &= 400 \text{ pictures} \end{aligned}$$

- b. Figure 13–9A graphs marginal revenue and marginal cost.
- Marginal cost starts out high at lower quantity levels, decreases to a minimum through production and marketing efficiencies, and then rises again due to the inefficiencies of overworked labor and equipment.
  - Marginal revenue follows a downward slope.
- c. Figure 13–9B graphs total cost and total revenue curves that correspond to the marginal cost and marginal revenue curves.
- Total cost initially rises as quantity increases but increases at the slowest rate at the quantity where marginal cost is lowest.
  - The total revenue curve increases to a maximum and then starts to decline.
- d. The message of marginal analysis is to operate up to the quantity and price level where marginal revenue equals marginal cost (MR = MC).
- Up to the output quantity at which MR = MC, each increase in total revenue resulting from selling one additional unit exceeds the increase in the total cost of producing and marketing that unit.
  - Beyond the point at which MR = MC, however, the increase in total revenue from selling one more unit is less than the cost of producing and marketing that unit.
  - At the quantity at which MR = MC, the total revenue curve lies farthest above the total cost curve, they are parallel, and profit is a maximum.
- e. The row shaded in brown in Figure 13–10 shows that the break-even quantity at a price of \$100 per picture is 400 pictures.
- At less than 400 pictures, the picture frame store incurs a loss.
  - At more than 400 pictures, the picture frame store makes a profit.



- f. Figure 13–10 also shows that if the annual picture sales double to 800, the picture frame store would make a profit of \$28,000—the row shaded in green in the figure.
- g. Figure 13–11 shows a **break-even chart**, which:
- Is a graphic presentation of the break-even analysis that shows when total revenue and total cost intersect to identify profit or loss for a given quantity sold.
  - Shows that the break-even quantity at a price of \$100 per picture is 400 pictures.
  - Also shows that if the annual picture sales double to 800, the picture frame store would make a profit of \$28,000.

## 2. Applications of Break-Even Analysis.

- a. The power of break-even analysis is shown in Figure 13–12.
- If an electronic calculator manufacturer automates its production, thereby increasing fixed cost and reducing variable cost by substituting machines for workers, this increases the breakeven point from 333,333 to 500,000 units per year.
  - Note in this example that only the fixed costs increase immediately.
  - The manufacturer hopes these fixed costs will be offset in the longer run by reduced unit variable costs.
  - But what about the impact of the higher level of fixed costs on profit? Remember, profit at any output quantity is given by:

$$\begin{aligned}\text{Profit} &= \text{Total Revenue} - \text{Total Cost} \\ &= (P \times Q) - [FC + (UVC \times Q)]\end{aligned}$$

– Before automation, profit at 1 million units of sales is:

$$\begin{aligned}\text{Profit} &= (P \times Q) - [FC + (UVC \times Q)] \\ &= (\$10 \times 1,000,000) - [\$1,000,000 + (\$7 \times 1,000,000)] \\ &= \$10,000,000 - \$8,000,000 \\ &= \$2,000,000\end{aligned}$$

– After automation, profit at 1 million units of sales is:

$$\begin{aligned}\text{Profit} &= (P \times Q) - [FC + (UVC \times Q)] \\ &= (\$10 \times 1,000,000) - [\$4,000,000 + (\$2 \times 1,000,000)] \\ &= \$10,000,000 - \$6,000,000 \\ &= \$4,000,000\end{aligned}$$

- Automation, by adding to fixed costs, increases profit by \$2 million at 1 million units of sales.

### LEARNING REVIEW

**7. What is the difference between fixed costs and variable costs?**

Answer: Fixed cost is the sum of the expenses of the firm that are stable and do not change with the quantity of the product that is produced and sold. Variable cost is the sum of the expenses of the firm that vary directly with the quantity of the product that is produced and sold.

**8. What is a break-even point?**

Answer: A break-even point (BEP) is the quantity at which total revenue and total cost are equal.

### APPLYING MARKETING KNOWLEDGE

**1. How would the price equation apply to the purchase price of (a) petrol, (b) an airline ticket, and (c) a bank current (checking) account?**

Answers:

ITEM PURCHASED	FINAL LIST PRICE	DISCOUNTS AND ALLOWANCES (-)	EXTRA FEES (+)
a. <b>Petrol</b>	Final price = Pump price	- Cash discount	
b. <b>Airline ticket</b>	Final fare = Standard coach fare	- Seasonal, frequent flyer, and off-peak discounts	+ Premium for first class, peak hours flight
c. <b>Bank current (checking) account</b>	Service charge = Standard service charge	- Discount for checking balance over set amount	+ Per check charge based on activity

**2. What would be your response to the statement, “Profit maximization is the only legitimate pricing objective for the firm”?**

Answer: Profit maximization is not the only legitimate pricing objective for a firm. Often, a firm sets a target return or a long-run profit objective. Nonprofit goals, such as unit sales, market share, as well as social responsibility objectives are also legitimate pricing goals.

**3. How is a downward-sloping demand curve related to total revenue and marginal revenue?**

Answer: A total revenue curve is developed by multiplying the unit price times the quantity for each point on the demand curve. As price is reduced, total revenue increases and marginal revenue decreases, but is positive. Below the point on the demand curve where marginal revenue equals zero, total revenue decreases and marginal revenue becomes negative.

**4. A marketing executive once said, “If the price elasticity of demand for your product is inelastic, then your price is probably too low.” What is this executive saying in terms of the economic principles discussed in this chapter?**

Answer: If the price elasticity of demand for a given product is inelastic, then a price increase will also increase total revenue. Therefore, the executive is saying that a price increase will increase total revenue.

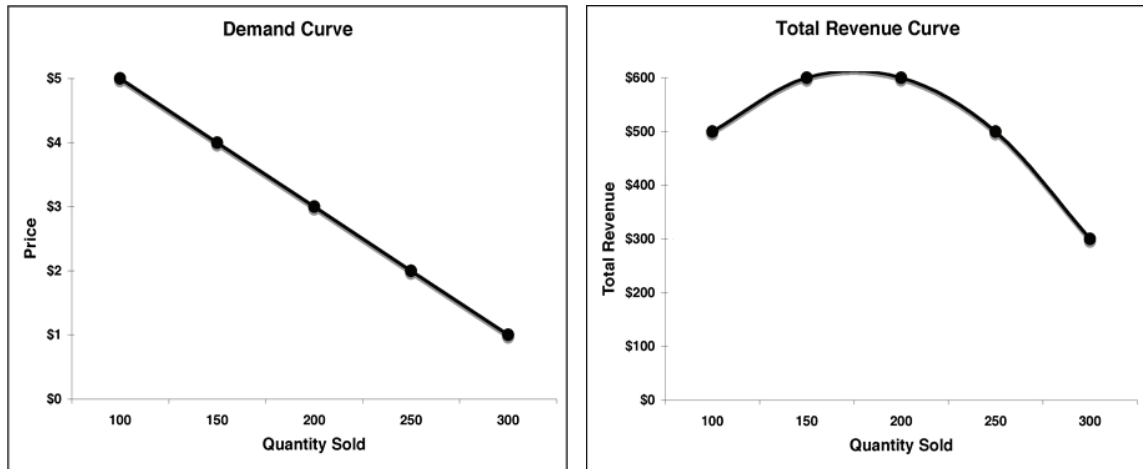
**5. A marketing manager reduced the price on a brand of cereal by 10 percent and observed a 25 percent increase in quantity sold. The manager then thought that if the price were reduced by another 20 percent, a 50 percent increase in quantity sold would occur. What would be your response to the marketing manager’s reasoning?**

Answer: The marketing manager is reasoning that if s/he doubles the price cut on the brand of cereal, then quantity sold will also double. This would imply that the actual demand curve for this particular product is a straight line and that price elasticity of demand is the same over all possible prices of the product. However, in actuality, demand curves are generally convex, and price elasticities vary at different prices along the demand curve.

**6. A student theater group at a university has developed a demand schedule that shows the relationship between ticket prices and demand based on a student survey, as follows:**

<b>TICKET PRICE</b>	<b>NUMBER OF STUDENTS WHO WOULD BUY</b>
\$1	300
2	250
3	200
4	150
5	100

**(a) Graph the demand curve and the total revenue curve based on these data. What ticket price might be set based on this analysis?**



Answers: Based on this analysis, the ticket price should be set at \$3. At this price, total revenue is highest at \$600. The total revenue is the same at \$4 but costs are lower at \$3.

**(b) What other factors should be considered before the final price is set?**

Answer: Other factors that should be considered include the total costs of the theater production, the seating capacity of the theater, and the responsibility of the theater to charge a price that all students can afford.

7. **Touché Toiletries, Inc., has developed an addition to its Lizardman Cologne line tentatively branded Ode d’Toade Cologne. Unit variable costs are 45 cents for a three-ounce bottle, and heavy advertising expenditures in the first year would result in total fixed costs of \$900,000. Ode d’Toade Cologne is priced at \$7.50 for a three-ounce bottle. How many bottles of Ode d’Toade must be sold to break even?**

Answer:

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{Unit Price} - \text{Unit Variable Cost}}$$

$$\text{BEP} = \frac{\$900,000}{\$7.50 - \$0.45}$$

$$\text{BEP} = 127,660 \text{ units}$$

8. **Suppose that marketing executives for Touché Toiletries reduced the price to \$6.50 for a three-ounce bottle of Ode d’Toade and the fixed costs were \$1,100,000. Suppose further that the unit variable cost remained at 45 cents for a three-ounce bottle.**

**(a) How many bottles must be sold to break even? (b) What dollar profit level would Ode d'Toade achieve if 200,000 bottles were sold?**

Answers:

a. The number of bottles that needed to be sold to break even is:

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{Unit Price} - \text{Unit Variable Cost}}$$

$$\text{BEP} = \frac{\$1,100,000}{\$6.50 - \$0.45}$$

$$\text{BEP} = 181,818 \text{ units}$$

b. The profit received if 200,000 bottles were sold is:

$$\begin{aligned} \text{Profit} &= \text{Total Revenue} - \text{Total Cost} \\ &= (\text{Unit Price} \times \text{Quantity Sold}) - \text{Total Cost} \\ &= (P \times Q) - [\text{FC} + (\text{UVC} \times Q)] \\ &= (\$6.50 \times 200,000) - [\$1,100,000 + (\$0.45 \times 200,000)] \\ &= \$1,300,000 - [\$1,100,000 + \$90,000] \end{aligned}$$

$$\text{Profit} = \$110,000$$

**9. Executives of Random Recordings, Inc., produced an album entitled *Sunshine/Moonshine* by the Starshine Sisters Band.**

**(a) Using the price and cost information in the table, prepare a chart like that in Figure 13-10 showing total cost, fixed cost, and total revenue for album quantity sold levels starting at 10,000 albums through 100,000 albums at 10,000 album intervals, that is, 10,000; 20,000; 30,000; and so on. (b) What is the break-even point for the album?**

Selling price	\$7.00 per album
Album cover	\$1.00 per album
Songwriter's royalties	\$0.30 per album
Recording artists' royalties	\$0.70 per album
Direct material and labor costs to produce the album	\$1.00 per album
Fixed cost of producing an album (advertising, studio fee, etc.)	\$100,000

Answers:

a. The chart, based on Figure 13-10, is:

Quantity Sold (Q)	Price per Album (P)	Total Revenue (TR)	Unit Variable Cost (UVC)	Total Variable Cost (VC = UVC x Q)	Fixed Cost (FC)	Total Cost (TC = FC + VC)	Profit (TR - TC)
10,000	\$7	\$70,000	\$3	\$30,000	\$100,000	\$130,000	(\$60,000)
20,000	\$7	\$140,000	\$3	\$60,000	\$100,000	\$160,000	(\$20,000)
30,000	\$7	\$210,000	\$3	\$90,000	\$100,000	\$190,000	\$20,000
40,000	\$7	\$280,000	\$3	\$120,000	\$100,000	\$220,000	\$60,000
50,000	\$7	\$350,000	\$3	\$150,000	\$100,000	\$250,000	\$100,000
60,000	\$7	\$420,000	\$3	\$180,000	\$100,000	\$280,000	\$140,000
70,000	\$7	\$490,000	\$3	\$210,000	\$100,000	\$310,000	\$180,000
80,000	\$7	\$560,000	\$3	\$240,000	\$100,000	\$340,000	\$220,000
90,000	\$7	\$630,000	\$3	\$270,000	\$100,000	\$370,000	\$260,000
100,000	\$7	\$700,000	\$3	\$300,000	\$100,000	\$400,000	\$300,000

b. The break-even point for the album is:

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{Unit Price} - \text{Unit Variable Cost}}$$

$$\text{BEP} = \frac{\$100,000}{\$7.00 - (\$1.00 + \$0.30 + \$0.70 + \$1.00)}$$

$$\text{BEP} = 25,000 \text{ units}$$

## BUILDING YOUR MARKETING PLAN

**In starting to set a final price:**

**1. List two pricing objectives and three pricing constraints.**

Answer: In Question #1, writing on paper several pricing objectives and pricing constraints are intended to help students start to confront pricing realities. For example, perhaps a new, underfunded small business has the practical pricing objective of needing to break even in six months or sooner. Or perhaps a pricing constraint for a small manufacturer is to offer firms in its channel of distribution the conventional margins used in its industry.

2. **Think about your customers and competitors and set three possible prices.**
3. **Assume a fixed cost and unit variable cost and (a) calculate the break-even points and (b) plot a break-even chart for the three prices specified in step 2.**

Answer: Questions #2 and #3 force students to dig into key fixed and unit variable costs plus assume three prices in order to calculate break-even points and plot the related break-even charts. Reality may set in when students discover they have to sell five times as many units as they assumed, just to break even.

### **Helping with Common Student Problems**

“But I don’t know what the fixed costs for a flower shop are going to be” is a common student complaint. The simple instructor answer: “Well then you’d better do some data digging and make some simple assumptions. And by the way, please put those assumptions in your plan so we know your starting point.”

Probably the biggest surprise from students in the hundreds of marketing plans we’ve read and graded: How many more widgets they have to sell than they expected—just to start covering the fixed costs. Another concern for students is what the units of quantity sold will be, say, for a flower shop when there are so many different plants and bouquets that might be sold. The solution is similar to that used in the frame-shop example in Chapter 13: Select the “average” or “typical” dollar sales as the “unit sold.”

Students need to be encouraged to alter whatever assumptions are appropriate to calculate their final break-even point and related potential profit.

## **SLN 13-1: SUPPLEMENTAL LECTURE NOTE**

### **Teenage Smoking: Cool, Price Elasticity, and \$1-a-Pack Cigarettes!**

About 400,000 Americans die every year from tobacco use (1,200 every day). More than 80 percent of smokers began before they were 18 years old. And of the 4,000 kids that try their first cigarette every day, 1,200 become regular addicted smokers. Sadly, one-third of these regular smokers will die a premature death from tobacco use.

- **The appeals.** Tobacco companies spend more than \$13 billion each year marketing their products, and kids are almost twice as likely as adults to remember tobacco advertising. Their marketing efforts make tobacco use seem cool, hip, and fashionable—just a normal part of everyday life when in fact it is deadly.
- **The solutions.** Comprehensive tobacco prevention programs that include media and community-based efforts to change the way tobacco do work to reduce youth smoking when they are properly funded and implemented.

- **Community action.** In the 1970s, about 25% of both African-American and white teenagers smoked. By the 1990s, 23% of white teens and only 4% of black teens smoked. The reason for the latter: black leaders mobilized their communities against cigarettes marketed at their young people.
- **Media Campaigns. Show Slide 13-46.** State “counter-marketing” campaigns have changed attitudes and tobacco use among young people. This anti-smoking ad from South Carolina, directed at legislators and policy makers in the state, is an effective attempt to use price elasticity to cause teens and kids to reduce or cease their smoking. Since cigarettes are price elastic, the higher cigarette tax increases the price of a pack of cigarettes, which results in fewer teens and kids who will smoke.
- **Price elasticity.** In the early 1980s, Canada became alarmed at the soaring costs of tobacco-related illnesses and added a \$5 tax to the price of a pack of cigarettes. This cut smoking among teenage Canadians by more than half. The results are supported by U.S. price elasticity studies that show a 10% price hike will cut teen or youth smoking by 3-7%. And combined with state-funded tobacco prevention programs, youth smoking declined by 40 percent between 1997 and 2003. Recently, progress in reducing youth smoking has stalled because tobacco companies have cut prices and increased their marketing expenditures, and states have cutback on tobacco prevention programs.
- **The Future.** So what will it take to further reduce youth smoking? Are smoke-free laws and community action changing the way kids think about tobacco? Will states summon the will to fund programs proven to reduce smoking? Also, can teens afford over \$3.00 per pack price for name brand cigarettes? While teen smoking is declining by as much as 15 percent per year in states with anti-smoking campaigns, many teens have access to the \$1 to \$2 per pack cigarettes produced by small privately held U.S. firms.

Sources: Nicole Dueffert, Communications: Campaign for Tobacco-Free Kids as well as Factsheets—(1) Raising Cigarette Taxes Reduces Smoking, Especially Among Kids and (2) Tobacco Company Marketing to Kids from [www.tobaccofreekids.org](http://www.tobaccofreekids.org); Alexander Ding, “Youth Are More Sensitive to Price Changes in Cigarettes than Adults,” *The Yale Journal of Biology and Medicine* (May 1, 2003), pp. 115-124; and Daren Fonda, “Why Tobacco Won’t Quit,” *Time* (July 2, 2001), pp. 38-39.