

# Strategic Tools

*The Red Queen said:  
‘Now, here, it takes  
all the running you  
can do to keep in the  
same place. If you want  
to get somewhere else,  
you must run twice as  
fast as that.’*

LEWIS CARROLL  
(ALICE IN WONDERLAND)

Strategy development is by no means an easy job. Not only must decision makers review a variety of inside factors, they must also incorporate the impact of environmental changes in order to design viable strategies. Strategists have become increasingly aware that the old way of “muddling through” is not adequate when confronted by the complexities involved in designing a future for a corporation.

Economic uncertainty, leveling off of productivity, international competition, and environmental problems pose new challenges with which corporations must cope when planning their strategies. There is, therefore, a need for systematic procedures for formulating strategy. This chapter discusses selected tools and models that serve as aids in strategy development.

A **model** may be defined as an instrument that serves as an aid in searching, screening, analyzing, selecting, and implementing a course of action. Because marketing strategy interfaces with and affects the perspectives of an entire corporation, the tools and models of the entire science of management can be considered relevant here. In this chapter, however, we deal with eight models that exhibit direct application to marketing strategies: the experience curve concept, PIMS model, value-based planning, game theory, the delphi technique, trend-impact analysis, cross-impact analysis, and scenario building. In addition, a variety of new tools that are commonly used by strategic planners are summarily listed.

## EXPERIENCE CURVE CONCEPT

Experience shows that practice makes perfect. It is common knowledge that beginners are slow and clumsy and that with practice they generally improve to the point where they reach their own permanent level of skill. Anyone with business experience knows that the initial period of a new venture or expansion into a new area is frequently not immediately profitable. Many factors, such as making a product name known to potential customers, are often cited as reasons for this nonprofitability. In brief, even the most unsophisticated businessperson acknowledges that experience and learning lead to improvement. Unfortunately,

the significance of experience is realized only in abstract terms. For example, managers in a new and unprofitable situation tend to think of experience in vague terms without ever analyzing it in terms of cost. This statement applies to all functions of a business where cost improvements are commonly sought—except for production management.

As growth continues, we anticipate greater efficiency and more productive output. But how much improvement can one reasonably expect? Generally, management makes an arbitrary decision to ascertain what level of output reflects the optimum level. Obviously, in the great majority of situations, this decision is primarily based on pure conjecture. Ideally, however, one should be able to use historical data to predict cost/volume relationships and learning patterns. Many companies have, in fact, developed their own learning curves—but only in the areas of production or manufacturing where tangible data are readily available and most variables can be quantified.

Several years ago the Boston Consulting Group observed that the concept of experience is not limited to production alone. The experience curve concept embraces almost all cost areas of business.

Unlike the well-known “learning curve” and “progress function,” the experience curve effect is observed to encompass all costs—capital, administrative, research and marketing—and to have transferred impact from technological displacements and product evolution.<sup>1</sup>

#### *Historical Perspective*

The experience effect was first observed in the aircraft industry. Because the expense incurred in building the first unit is exceptionally high in this industry, any reduction in the cost of manufacturing succeeding units is readily apparent and becomes extremely pertinent in any management decision regarding future production. For example, it has been observed that an “80 percent air frame curve” could be developed for the manufacture of airplanes. This curve depicts a 20 percent improvement every time production doubles (i.e., to produce the fourth unit requires 80 percent of the time needed to produce the second unit, and so on).<sup>2</sup> Studies of the aircraft industry suggest that this rate of improvement seems to prevail consistently over the range of production under study; hence, the label *experience* is applied to the curve.

#### *Implications*

Although the significance of the experience curve concept is corporate-wide, it bears most heavily on the setting of marketing objectives and the pricing decision. As already mentioned, according to the experience curve concept, all costs go down as experience increases. Thus, if a company acquired a higher market share, its costs would decline, enabling it to reduce prices. The lowering of prices would enable the company to acquire a still higher market share. This process is unending as long as the market continues to grow. But as a matter of strategy, while aiming at a dominant position in the industry, the company may be wise to stop short of raising the eyebrows of the Antitrust Division of the U.S. Department of Justice.

During the growth phase, a company keeps making the desired level of profit, but in order to provide for its growth, a company needs to reinvest profits. In fact, further resources might need to be diverted from elsewhere to support such growth. Once the growth comes to an end, the product makes available huge cash throw-offs that can be invested in a new product.

The Boston Consulting Group claims that, in the case of a second product, the accumulated experience of the first product should provide an extra advantage to the firm in reducing costs. However, experience is transferable only imperfectly. There is a transfer effect between identical products in different locations, but the transfer effect between different products occurs only if the products are somewhat the same (i.e., in the same family). This is true, for instance, in the case of the marketing cost component of two products distributed through the same trade channel. Even in this case, however, the loss of buyer “franchise” can result in some lack of experience transferability. Exhibit 12-1 is a diagram of the implications of the experience curve concept.

Some of the Boston Consulting Group’s claims about the experience effect are hard to substantiate. In fact, until enough empirical studies have been done on the subject, many claims may even be disputed.<sup>3</sup> For example, conventional wisdom holds that market share drives profitability. Certainly, in some industries, such as chemicals, paper, and steel, market share and profitability are inextricably linked. But the profitability of premium brands—brands that sell for 25% to 30% more than private-label brands—in 40 categories of consumer goods, the market share alone did not drive profitability.

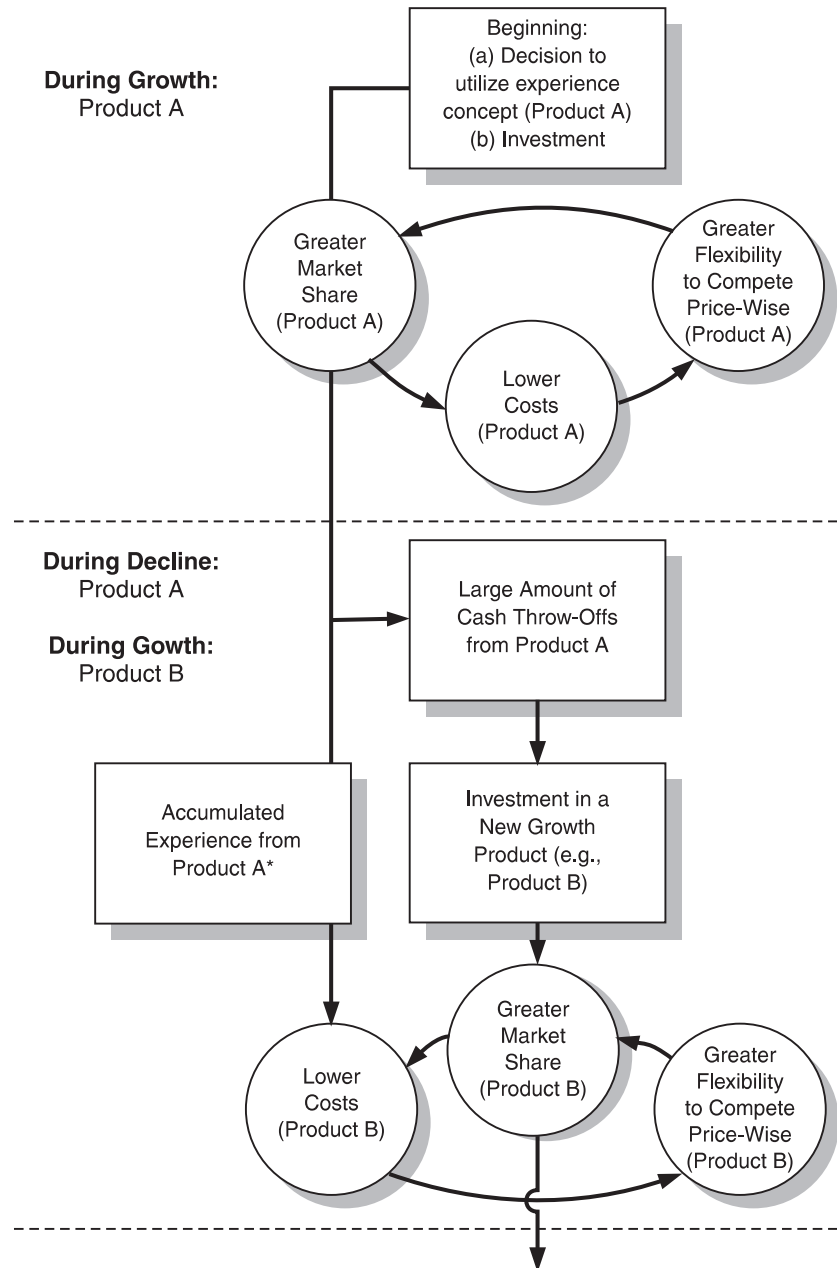
Instead, both market share and the nature of the category, or product market, in which the brand competes, drive a brand’s profitability. A brand’s relative market share has a different impact on profitability depending on whether the overall category is dominated by premium brands or by value brands. If a category is composed largely of premium brands, then most of the brands in the category are—or should be—quite profitable. If the category is composed mostly of value and private-label brands, then returns will be lower across the board.<sup>4</sup>

To summarize, the experience curve concept leads to the conclusion that all producers must achieve and maintain the full cost-reduction potential of their experience gains if they hope to survive. Furthermore, the experience framework has implications for strategy development, as shown in Exhibit 12-2. The appendix at the end of this chapter describes construction of experience curves, showing how the relationship between costs and accumulated experience can be empirically developed.

### *Application to Marketing*

The application of the experience curve concept to marketing requires sorting out various marketing costs and projecting their behavior for different sales volumes. It is hoped that the analyses will show a close relationship between increases in cumulative sales volume and declines in costs. The widening gap between volume and costs establishes the company’s flexibility in cutting prices in order to gain higher market share.

**EXHIBIT 12-1**  
*Schematic Presentation of Implications of the Experience Concept*



\*An assumption is made here that Product B is closely related to Product A.

**EXHIBIT 12-2**  
*Experience Curves Strategy Implications*

		Market Power	
		High	Low
Industry Growth Rate	High	Continue to invest increased market share up to "target" level	Assess competition; then either invest heavily in increased share, segment market, or withdraw
	Low	Obtain highest possible earnings consistent with maintaining market share	Assess competition; then either challenge, segment market, or withdraw

Declines in costs are logical and occur for reasons such as the following:

1. Economies of scale (e.g., lower advertising media costs).
2. Increase in efficiency across the board (e.g., ability of salespersons to reduce time per call).
3. Technological advances.

Conceivably, four different techniques could be used to project costs at different levels of volume: regression, simulation, analogy, and intuition. Because historical information on growing products may be lacking, the regression technique may not work. Simulation is a possibility, but it continues to be rarely practiced because it is strenuous. Drawing an analogy between the subject product and the one that has matured perhaps provides the most feasible means of projecting various marketing costs as a function of cumulative sales. But analogy alone may not suffice. As with any other managerial decision, analogy may need to be combined with intuition.

The cost characteristics of experience curves can be observed in all types of costs: labor costs, advertising costs, overhead costs, distribution costs, development costs, or manufacturing costs. Thus, marketing costs as well as those for production, research and development, accounting, service, etc., should be combined to see how total cost varies with volume. Further, total costs over different ranges of volume should be projected while considering the company's ability to finance an increased volume of business, to undertake an increased level of risk, and to maintain cordial relations with the Antitrust Division.

Each element of cost included in total cost may have a different slope on a graph. The aggregation of these elements does not necessarily produce a straight line on logarithmic coordinates. Thus, the relationship between cost and volume

is necessarily an approximation of a trend line. Also, the cost derivatives of the curve are not based on accounting costs but on accumulated cash input divided by accumulated end-product output. The cost decline of the experience curve is the rate of change in that ratio.

Management should establish a market share objective that projects well into the future. Estimates should be made of the timing of price cuts in order to achieve designated market share. If at any time a competitor happens to challenge a firm's market share position, the firm should go all out to protect its market share and never surrender it without an awareness of its value. Needless to say, the perspective of the entire corporation must change if the gains expected from a particular market share strategy are to become reality. Thus, proper coordination among different functions becomes essential for the timely implementation of related tasks.

Although the experience effect is independent of the life cycle, of growth rate, and of initial market share, as a matter of strategy it is safer to base one's actions on experience when the following conditions are operating: (a) the product is in the early stages of growth in its life cycle, (b) no one competitor holds a dominant position in the market, and (c) the product is not amenable to nonprice competition (e.g., emotional appeals, packaging). Because the concept demands undertaking a big offensive in a battle that might last many years, a well-drawn long-range plan should be in existence. Top management should be capable of undertaking risks and going through the initial period of fast activity involved in sudden moves to enlarge the company's operations; the company should also have enough resources to support the enlargement of operations.

The experience effect has been widely accepted as a basis for strategy in a number of industries, the aircraft, petroleum, consumer electronics, and a variety of durable and maintenance-related industries among them. The application of this concept to marketing has been minimal for the following reasons:

1. Skepticism that improvement can continue.
2. Difficulty with the exact quantification of different relationships in marketing.
3. Inability to recognize experience patterns even though they are already occurring.
4. Lack of awareness that the improvement pattern can be subjectively approximated and that the concept can apply to groups of employees as well as to individual performance across the board in different functions of the business.
5. Inability to predict the effect of future technological advances, which can badly distort any historical data.
6. Accounting practices that may make it difficult to segregate costs adequately.

Despite these obstacles, the concept adds new importance to the market share strategy.

## **PROFIT IMPACT OF MARKETING STRATEGY (PIMS)**

In 1960, the vice president of marketing services at GE authorized a large-scale project (called PROM, for profitability optimization model) to examine the profit impact of marketing strategies. Several years of effort produced a computer-based

model that identified the major factors responsible for a great deal of the variation in return on investment. Because the data used to support the model came from diverse markets and industries, the PROM model is often referred to as a cross-sectional model. Even today, cross-sectional models are popularly used at GE.

In 1972, the PROM program, henceforth called PIMS, was moved to the Marketing Science Institute, a nonprofit organization associated with the Harvard Business School. The scope of the PIMS program has increased so much and its popularity has gained such momentum that a few years ago its administration moved to the Strategic Planning Institute, a new organization established for PIMS.

The PIMS program is based on the experience of more than 500 companies in nearly 3,800 “businesses” for periods that range from two to twelve years. “Business” is synonymous with “SBU” and is defined as an operative unit that sells a distinct set of products to an identifiable group of customers in competition with a well-defined set of competitors. Essentially, PIMS is a cross-sectional study of the strategic experience of profit organizations. The information gathered from participating businesses is supplied to the PIMS program in a standardized format in the form of about 200 pieces of data. The PIMS database covers large and small companies; markets in North America, Europe, and elsewhere; and a wide variety of products and services, ranging from candy to heavy capital goods to financial services. The information deals with such items as

- A description of the market conditions in which the business operates, including such things as the distribution channels used by the SBU, the number and size of its customers, and rates of market growth and inflation.
- The business unit’s competitive position in its marketplace, including market share, relative quality, prices and costs relative to the competition, and degree of vertical integration relative to the competition.
- Annual measures of the SBU’s financial and operating performance over periods ranging from two to twelve years.

### *Overall Results*

The PIMS project indicated that the profitability of a business is affected by 37 basic factors, explaining the more than 80 percent profitability variation among businesses studied. Of the 37 basic factors, seven proved to be of primary importance (see Exhibit 12-3).

Based on analysis of information available in the PIMS database, Buzzell and Gale have hypothesized the following strategy principles, or links between strategy and performance:

1. In the long run, the most important single factor affecting a business unit’s performance is the quality of its products and services relative to those of competitors. A quality edge boosts performance in two ways. In the short run, superior quality yields increased profits via premium prices. In the longer term, superior or improving relative quality is the more effective way for a business to grow, leading to both market expansion and gains in market share.
2. Market share and profitability are strongly related. Business units with very large shares—over 50 percent of their served markets—enjoy rates of return more than

**EXHIBIT 12-3*****Return on Investment and Key Profit Issues***

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***Return on Investment (ROI):***

The ratio of net pretax operating income to average investment. Operating income is what is available after deduction of allocated corporate overhead expenses but before deduction of any financial charges on assets employed. "Investment" equals equity plus long-term debt, or, equivalently, total assets employed minus current liabilities attributed to the business.

***Market Share:***

The ratio of dollar sales by a business, in a given time period, to total sales by all competitors in the same market. The "market" includes all of the products or services, customer types, and geographic areas that are directly related to the activities of the business. For example, it includes all products and services that are competitive with those sold by the business.

***Product (Service) Quality:***

The quality of each participating company's offerings, appraised in the following terms: What was the percentage of sales of products or services from each business in each year that were superior to those of competitors? What was the percentage of equivalent products? Inferior products?

***Marketing Expenditures:***

Total costs for sales force, advertising, sales promotion, marketing research, and marketing administration. The figures do not include costs of physical distribution.

***R&D Expenditures:***

Total costs of product development and process improvement, including those costs incurred by corporate-level units that can be directly attributed to the individual business.

***Investment Intensity:***

Ratio of total investment to sales.

***Corporate Diversity:***

An index that reflects (1) the number of different 4-digit Standard Industrial Classification industries in which a corporation operates, (2) the percentage of total corporate employment in each industry, and (3) the degree of similarity or difference among the industries in which it participates.

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*Source:* Reprinted by permission of the *Harvard Business Review*. Exhibit from "Impact of Strategic Planning on Profit Performance" by Sidney Schoeffler, Robert D. Buzzell, and Donald F. Heany (March–April 1974): 140. Copyright © 1974 by the President and Fellows of Harvard College, all rights reserved.

three times greater than small-share SBUs (those that serve under 10 percent of their markets). The primary reason for the market share-profitability link, apart from the connection with relative quality, is that large-share businesses benefit from scale economies. They simply have lower per-unit costs than their smaller competitors.



3. High-investment intensity acts as a powerful drag on profitability. Investment-intensive businesses are those that employ a great deal of capital per dollar of sales, per dollar of value added, or per employee.
4. Many so-called “dog” and “question mark” businesses generate cash, while many “cash cows” are dry. The guiding principle of the growth-share matrix approach to planning (see Chapter 10) is that cash flows largely depend on market growth and competitive position (your share relative to that of your largest competitor). However, the PIMS-based research shows that, while market growth and relative share are linked to cash flows, many other factors also influence this dimension of performance. As a result, forecasts of cash flow based solely on the growth-share matrix are often misleading.
5. Vertical integration is a profitable strategy for some kinds of businesses, but not for others. Whether increased vertical integration helps or hurts depends on the situation, quite apart from the question of the cost of achieving it.
6. Most of the strategic factors that boost ROI also contribute to long-term value.<sup>5</sup>

These principles are derived from the premise that business performance depends on three major kinds of factors: the characteristics of the market (i.e., market differentiation, market growth rate, entry conditions, unionization, capital intensity, and purchase amount), the business’s competitive position in that market (i.e., relative perceived quality, relative market share, relative capital intensity, and relative cost), and the strategy it follows (i.e., pricing, research and development spending, new product introductions, change in relative quality, variety of products/services, marketing expenses, distribution channels, and relative vertical integration). Performance refers to such measures as profitability (ROS, ROI, etc.), growth, cash flow, value enhancement, and stock prices.

### *Managerial Applications*

The PIMS approach is to gather data on as many actual business experiences as possible and to search for relationships that appear to have the most significant effect on performance. A model of these relationships is then developed so that an estimate of a business’s return on investment can be made from the structural competitive/strategy factors associated with the business. Obviously, the PIMS conceptual framework must be modified on occasion. For example, repositioning structural factors may be impossible and the costs of doing so prohibitive. Besides, actual performance may reflect some element of luck or some unusual event.<sup>6</sup> In addition, results may be influenced by the transitional effect of a conscious change in strategic direction.<sup>7</sup> Despite these reservations, the PIMS framework can be beneficial in the following ways:

1. It provides a realistic and consistent method for establishing potential return levels for individual businesses.
2. It stimulates managerial thinking on the reasons for deviations from par performance.
3. It provides insight into strategic moves that will improve the par return on investment.
4. It encourages a more discerning appraisal of business unit performance.

Since the mid-1970s, the PIMS database has been used by managers and planning specialists in many ways. Applications include developing business plans, evaluating forecasts submitted by divisional managers, and appraising possible strategies. The data suggests that<sup>8</sup>

- For followers, current profitability is adversely affected by a high level of product innovation, measured either by the ratio of new product sales to total sales or by research and development spending. The penalty paid for innovation is especially heavy for businesses ranked fourth or lower in their served markets. The market leader's profitability, on the other hand, is not hurt by new product activity or research and development spending.
- High rates of marketing expenditure depress return on investment for followers, not for leaders.
- Low-ranking market followers benefit from high inflation. For businesses ranked first, second, and third, inflation has no relation to return on investment.

## MEASURING THE VALUE OF MARKETING STRATEGIES

In the last few years, a new yardstick for measuring the worth of marketing strategies has been suggested. This new approach, called **value-based planning**, judges marketing strategies by their ability to enhance shareholders' value. It emphasizes the impact a strategic move has on the *value* investors place on the equity portion of a firm's assets.<sup>9</sup> The principal feature of value-based planning is that managers should be evaluated on their ability to make strategic investments that produce returns greater than their cost of capital.

Value-based planning draws ideas from contemporary financial theory. For example, a company's primary obligation is to maximize returns from capital appreciation. Similarly, the market value of a stock depends on investors' expectations of the ability of each business unit in the firm to generate cash.<sup>10</sup>

Value is created when the financial benefits of a strategic activity exceed costs. To account for differences in the timing and riskiness of the costs and benefits, value-based planning estimates overall value by discounting all relevant cash flows.

A company that has been using the value-based approach for some time is the Connecticut-based Dexter Corporation. Its value-based planning uses four sub-systems:<sup>11</sup>

- The Dexter financial decision support system (DSS), which provides strategic business segments (SBS) with financial data. The DSS provides a monthly profit and loss and balance sheet statement of each strategic business segment. All divisional expenses, assets, and current liabilities are allocated to the SBSs.
- A microcomputer-based system, which transforms this data for use in the two following subsystems: corporate financial reports system and value planner system. The financial data generated by DSS must be transformed to fit the input specifications of these two subsystems.
- The corporate financial reports system estimates the cost of capital of an SBS. For estimating cost of capital, Dexter uses two models. The first is the bond-rating

simulation model. This model is used to estimate the capital structure appropriate to each of its SBSs, given its six-year financial history. Each SBS is assigned the highest debt-to-total capital ratio that would allow it to receive an A bond rating. The second model, which is used to compute cost of capital, is the business risk index estimation model. This model allows cost of equity to be estimated for business segments that are not publicly traded.

- The value planner system estimates a business's future cash flows. The basic premise of the value planner system is that business decisions should be based on a rigorous consideration of expected future cash flows. Dexter uses the 12 most recent quarters of SBS data to produce a first-cut projection of future cash flows. As information on a new quarter becomes available, the oldest quarter in the model is deleted. These historical trends are used for projecting financial ratios into the future. The following assumptions are made to compute future cash flows:

**Sales growth**—Based on the expectation that each SBS will maintain market share.

**Net plant investment**—Based on the growth rate in unit volume deemed necessary to maintain Dexter's market share.

**Unallocated divisional expenses**—Projected for each SBS using the same percentage of sales used for the division as a whole.

**The appropriate time horizon for cash flow projections**—Based on the expected number of years that a business can reinvest at an expected rate of return.

These assumptions are controversial because they do not allow cash flow projections to be tailored to each SBS. Dexter management terms its historical forecast a *naïve* projection and uses it to challenge its managers to explain why the future will be different from the recent past.

The next step in the value-based planning process is to compute the value of projected future cash flows and to discount them by the cost of capital for an SBS. If the estimated value of an SBS is in excess of its book value, the SBS contributes positively to the wealth of Dexter's stockholders, which means it makes sense to reinvest in it.

The major strengths of Dexter's SBS value planner system have been articulated as follows:

- **Its emphasis on being intelligible to line managers**—A value-based planning model can indicate which SBSs are not creating value for the firm's stockholders. However, it is the SBS manager who must initiate action to rectify problems that the analysis uncovers.
- **Its degree of accuracy**—The real dilemma in designing models for value-based planning is to make them easy to use while improving the accuracy with which they reflect or predict the firm's market value.
- **Its integration with existing systems and databases**—By developing a system that works with existing systems, costs are reduced and upgrades are easier to implement. Also, it is easier to gain the acceptance of line managers if the value-based planning system is presented as an extension of the decision support system they are currently using.

In the seven years that Dexter has used the value-based approach, it has made important contributions to the decision-making process. Using this approach, Dexter managers made the following decisions:

- Not to invest further in an SBS with high-growth prospects until its valuation, based on actual performance, increases significantly.
- To harvest and downsize an SBS with a negative value.
- To sell an SBS with negative value to its employees for book value.
- To sell an SBS with a value higher than book value but for which an offer was received that was significantly greater than any valuation that could be reasonably modeled in Dexter's hands.

The interesting characteristic of these decisions is that they can run somewhat counter to the prescriptions that flow out of a typical portfolio-planning approach. The first decision, for example, refers to a star business, presumably worthy of further investment. Unlike portfolio planning, in which growth is desirable in and of itself, under value-based planning, growth is healthy only if the business is creating value.

Dexter uses value-based planning as a guideline for decision making, not as an absolute rule. The approach is, in general, understood and accepted, but many managers question its relevance. They now know whether their divisions create value for the company, but they do not understand how they can use that information to make or change important business decisions. Top management understands that value-added planning needs more time before it is completely accepted.

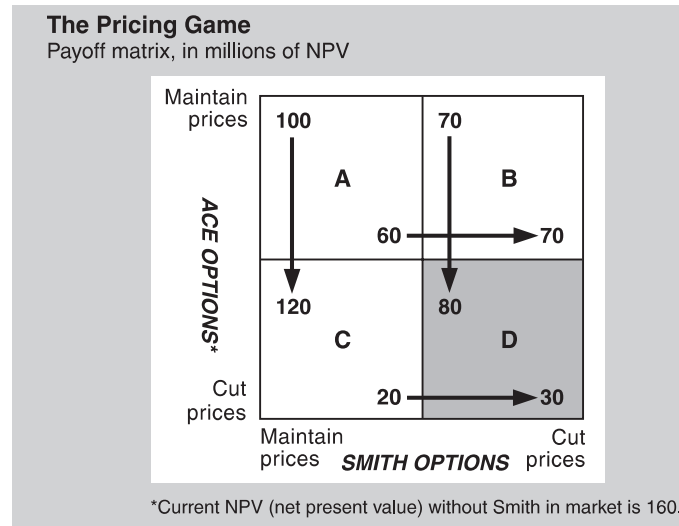
## GAME THEORY

Game theory is a useful technique for companies to rapidly respond to changes in products, technologies, and prices. It helps companies pay attention to interactions with competitors, customers, and suppliers, and induces companies to focus on the end-game so that their near-term actions promote their long-term interest by influencing what these players do.

The theory is reasonably straightforward to use. There are two competitors, Ace and Smith. Ace expects Smith to enter the market and is trying to understand Smith's likely pricing strategy. To do so, Ace uses something called a *payoff matrix* (see Exhibit 12-4). Each quadrant in the matrix contains the payoffs—or financial impact—to each player for each possible strategy. If both players maintain prices at current levels, they will both be better off: Ace will earn \$100 million and Smith will earn \$60 million (Quadrant A). Unfortunately for both Ace and Smith, however, they have perverse incentives to cut prices.

Ace calculates that if he maintains prices, Smith will cut prices to increase earnings to \$70 million from \$60 million. (See the arrow moving from Quadrant A to Quadrant B.) Smith makes a similar calculation that if she maintains prices, Ace will cut. The logic eventually drives them both to Quadrant D, with both cutting prices and both earning lower returns than they would with current prices in

## EXHIBIT 12-4

*Game Theory: An Illustration of the Pricing Game*

place. This equilibrium is unattractive for both parties. If each party perceives this, then there is some prospect that each will separately determine to try to compete largely on other factors, such as product features, service levels, sales force deployment, or advertising.

But it is necessary to have in-depth knowledge of the industry before game theory is truly valuable. Whether the goal is to implement by fully quantifying the outcomes of a payoff matrix or by more qualitatively assessing the outcome of the matrix, it is necessary to understand entry costs, exit costs, demand functions, revenue structures, cost curves, etc. Without that understanding, the game theory may not provide correct answers.

The following are the rules to observe to make the best use of the theory:

- **Examine the number, concentration, and size distribution of the players.** Industries with four or fewer significant competitors have the greatest potential for using game theory to gain an edge because (a) the competitors will usually be large enough to benefit more from an improvement in general industry conditions than they would from improving their position at the expense of others, and (b) with smaller numbers of competitors it is possible for managers to think through the different combinations of moves and countermoves. Similarly, the number of customers, suppliers, etc., affects the usefulness of game theory.
- **Keep an eye out for strategies inherent in one's market share.** Small players can use "judo economics" to take advantage of larger companies that may be more concerned with maintaining the status quo than with retaliating against a small entrant. In 1992, for instance, Kiwi Airlines got away with undercutting Delta's

and Continental's prices between Atlanta and Newark by as much as 75 percent. The reason: When Kiwi first entered the market it represented less than 7 percent of that route's capacity, and the cost of a significant pricing response by the incumbents would have likely exceeded the benefits.<sup>12</sup> Conversely, large players can create economies of scale or scope. Companies such as United and American have used frequent-flier programs to create switching barriers, whereas most small airlines would not have the route structure required to make their frequent-flier programs very attractive.

- **Understand the nature of the buying decision.** If there are only a few deals signed in an industry each year, it will be hard to avoid aggressive competition. In the jet engine industry, for example, three manufacturers (GE, Pratt & Whitney, and Rolls Royce) compete ruthlessly for scarce orders. If a producer loses several large bids in a row, layoffs will be likely, and it might even go out of business. In this kind of situation, the challenge for game theory is to improve the bidding process to shift the power balance between the industry and its customers.
- **Scrutinize the competitors' cost and revenue structures.** Industries where competitors have a high proportion of fixed-to-variable cost will probably behave more aggressively than those where production costs are more variable. In the paper, steel, and refining industries, for example, high profit contributions on extra volume give most producers strong incentives to cut prices to get volume.
- **Examine the similarity of firms.** Industries where competitors have similar cost and revenue structures often exhibit independently determined but similar behavior. Consider the U.S. cellular telephone industry: The two providers in each market share similar technologies, and have similar cost structures. Given their similar economic incentives, the challenge is to find prices that create the largest markets and then to compete largely on factors such as distribution and service quality.
- **Analyze the nature of demand.** The best chances to create value with less aggressive strategies are in markets where demand is stable or growing at a moderate rate. For example, even in oil-field services in the early 1980s after drilling activity had plummeted, declining demand did not lead to lower prices in all sectors. In those more-technology-demanding parts of the industry where there were only a limited number of competitors (e.g. open-hole logging and well-pressure control), prices were more stable than in other sectors.

Done right, game theory can turn conventional strategies on their heads and dramatically improve a company's ability to create economic value. Sometimes it can increase the size of the pie; on other occasions it can make a company's slice of the pie bigger, and it may even help do both.

## DELPHI TECHNIQUE

The **delphi technique**, named after Apollo's oracle at Delphi, is a method of making forecasts based on expert opinion. Traditionally, expert opinions were pooled in committee. The delphi technique was developed to overcome the weaknesses of the committee method. Some of the problems that occur when issues are discussed in committee include:

1. The influence of a dominant individual.
2. The introduction of a lot of redundant or irrelevant material into committee workings.
3. Group pressure that places a premium on compromise.
4. Reaching decisions is slow, expensive, and sometimes painful.
5. Holding members accountable for the actions of a group.

All of these factors provide certain psychological drawbacks to people in face-to-face communication. Because people often feel pressure to conform, the most popular solution, instead of the best one, prevails. With the delphi technique, a staff coordinator questions selected individuals on various issues. The following is a sample of questions asked:

1. What is the probability of a future event occurring? For example, by what year do you think there will be widespread use of robot services for refuse collection, as household slaves, as sewer inspectors, etc?
  - a. 2000
  - b. 2010
  - c. 2020
  - d. 2030
2. How desirable is the event in Question 1?
  - a. needed desperately
  - b. desirable
  - c. undesirable but possible
3. What is the feasibility of the event in Question 1?
  - a. highly feasible
  - b. likely
  - c. unlikely but possible
4. What is your familiarity with the material in Question 1?
  - a. fair
  - b. good
  - c. excellent

The coordinator compiles the responses, splitting them into three groups: lower, upper, and inner. The division into groups may vary from one investigation to another. Frequently, however, the lower and upper groups each represent 10 percent, whereas the inner group takes the remaining 80 percent. When a person makes a response in either the upper or lower group, it is customary to ask about the reasons for his or her extreme opinion.

In the next round, the respondents are given the same questionnaire, along with a summary of the results from the first round. The data feedback includes the consensus and the minority opinion. During the second round, the respondents are asked to specify by what year the particular product or service will come to exist with 50 percent probability and with 90 percent probability. Results

are once again compiled and fed back. This process of repeating rounds can be continued indefinitely; however, rarely has any research been conducted past the sixth round. In recent years, the delphi technique has been refined by the use of interactive computer programs to obtain inputs from experts, to present summary estimates, and to store revised judgments in data files that are retrievable at user terminals.

The delphi technique is gradually becoming important for predicting future events objectively. Most large corporations use this technique for long-range forecasting. Some of the advantages of the delphi technique are listed below:

1. It is a rapid and efficient way to gain objective information from a group of experts.
2. It involves less effort for a respondent to answer a well-designed questionnaire than to participate in a conference or write a paper.
3. It can be highly motivating for a group of experts to see the responses of knowledgeable persons.
4. The use of systematic procedures applies an air of objectivity to the outcomes.
5. The results of delphi exercises are subject to greater acceptance on the part of the group than are the consequences arrived at by more direct forms of interaction.

### *Delphi Application*

Change is an accepted phenomenon in the modern world. Change coupled with competition forces a corporation to pick up the trends in the environment and to determine their significance for company operations. In light of the changing environment, the corporation must evaluate and define strategic posture to be able to face the future boldly. Two types of changes can be distinguished: cyclical and developmental. A **cyclical change** is repetitive in nature; managers usually develop routine procedures to meet cyclical changes. A **developmental change** is innovative and irregular; having no use for the "good" old ways, managers abandon them. Developmental change appears on the horizon so slowly that it may go unrecognized or be ignored until it becomes an accomplished fact with drastic consequences. It is this latter category of change that assumes importance in the context of strategy development. The delphi technique can be fruitfully used to analyze developmental changes. Functionally, a change may fall into one of the following categories: social, economic, political, regulatory, or technological. The delphi technique has been used by organizations to study emerging perspectives in all these areas.

One drawback of the delphi technique is that each trend is given unilateral consideration on its own merits. Thus, one may end up with conflicting forecasts; that is, one trend may suggest that something will happen, whereas another may lead in the opposite direction. To resolve this problem, another forecasting technique, the cross-impact matrix (discussed later) has been used by some researchers. With this technique, the effect of potential interactions among items in a forecasted set of occurrences can be investigated. If the behavior of an individual item is predictable (i.e., if it varies positively or negatively with the occurrence or nonoccurrence of other items), the cross-impact effect is present. It is thus possible to determine whether a predicted event will have an enhancing or



inhibiting influence upon each of the other events under study by using a cross-impact matrix.

Recent research shows that the use of the delphi technique has undergone quite a change. The salient features of the revised delphi technique are (a) identifying recognized experts in the field of interest; (b) seeking their cooperation and sending them a summary paper on the topic being examined (based on a literature search); and (c) conducting personal interviews with each expert based on a structured questionnaire, usually by two interviewers. Feedback and repeated rounds of responding to written questionnaires are no longer considered necessary.

## TREND-IMPACT ANALYSIS

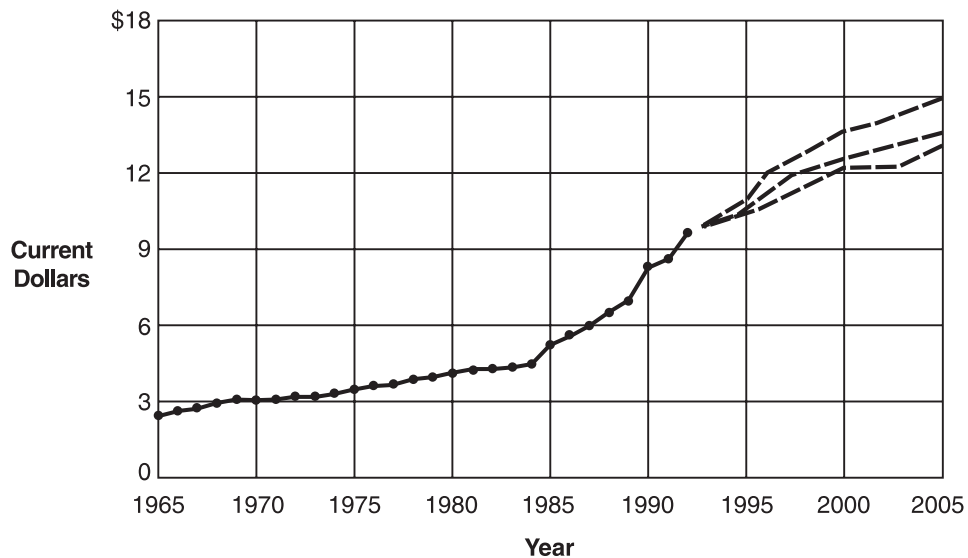
**Trend-impact analysis** is a technique for projecting future trends from information gathered on past behavior. The uniqueness of this method lies in its combination of statistical method and human judgment. If predictions are based on quantitative data alone, they will fail to reflect the impact of unprecedented future events. On the other hand, human judgment provides only subjective insights into the future. Therefore, because both human judgment and statistical extrapolation have their shortcomings, both should be taken into consideration when predicting future trends.

In trend-impact analysis (TIA), past history is first extrapolated with the help of a computer. Then the judgment of experts is sought (usually by means of the delphi technique) to specify a set of unique future events that may have a bearing on the phenomenon under study and to indicate how the trend extrapolation may be affected by the occurrence of each of these events. The computer then uses these judgments to modify its trend extrapolation. Finally, the experts review the adjusted extrapolation and modify the inputs in those cases in which an input appears unreasonable.

To illustrate TIA methods, let us consider the case of the average price of a new prescription drug to the year 2005. As shown in Exhibit 12-5, statistical extrapolation of historical data shows that price will rise to \$13 by the year 2000 and to \$14.23 by the year 2005. The events considered relevant include (a) generic dispensing, which increases 20 percent of all prescriptions filled; (b) Medicaid and Medicare prescription reimbursement, which is based on a fixed monthly fee per covered patient ("capitation plan"); and (c) a 50 percent decrease in the average rate of growth in prescription size. Consider the first event, i.e., 20 percent increase in generic dispensing. Expert judgment may show that this event has a 75 percent chance of occurring by 1997. If this event does occur, it is expected that its first impact on the average price of a new prescription will begin right away. The maximum impact, a 3 percent reduction in the average price, will occur after five years.

The combination of these events, probabilities, and impacts with the baseline extrapolation leads to a forecast markedly different from the baseline extrapolation (see Exhibit 12-5). The curve even begins to taper off in the year 2005. The level of uncertainty is indicated by quartiles above and below the mean forecast.

**EXHIBIT 12-5**  
*Average Retail Price of a New Prescription*



<i>Historical Data</i>				Forecast			
				<i>Lower Quartile</i>	<i>Mean</i>	<i>Upper Quartile</i>	
1962	2.17	1979	3.86	1993	10.65	10.70	10.75
1964	2.41	1980	4.02	1994	10.92	11.03	11.14
1966	2.78	1981	4.19	1995	11.21	11.40	11.61
1967	2.92	1982	4.32	1996	11.54	11.79	12.10
1968	2.99	1983	4.45	1997	11.83	12.15	12.54
1969	3.15	1984	4.70	1998	12.08	12.45	12.92
1970	3.22	1985	5.20	1999	12.30	12.74	13.25
1971	3.27	1986	5.60	2000	12.52	13.00	13.55
1972	3.26	1987	5.98	2001	12.74	13.25	13.83
1973	3.35	1988	6.44	2002	12.95	13.50	14.10
1974	3.42	1989	7.03	2003	13.17	13.75	14.38
1975	3.48	1990	7.66	2004	13.39	13.99	14.64
1976	3.56	1991	8.63	2005	13.60	14.23	14.90
1977	3.63	1992	10.37				
1978	3.70						

(The quartiles indicate the middle 50 percent of future values of the curve, with 25 percent lying on each side of the forecast curve.) The uncertainty shown by these quartiles results from the fact that many of the events that have large impacts also have relatively low probabilities.

At this juncture, it is desirable to determine the sensitivity of these results to the individual estimates upon which they are based. For example, one might raise valid questions about the estimates of event probability, the magnitude of the impacts used, and the lag time associated with these impacts. Having prepared these data in a disaggregated fashion, one can very easily vary such estimates and view the change in results. It may also be observed that intervention policies, whether they are institutional (such as lobbying, advertising, or new marketing approaches) or technological (such as increased research and development expenditures), can be viewed as a means of influencing event probabilities or impacts.

TIA can be used not only to improve forecasts of time series variables but also to study the sensitivity of these forecasts to policy. Of course, any policy under consideration should attempt to influence as many events as possible rather than one, as in this example. Corporate actions often have both beneficial and detrimental effects because they may increase both desirable and undesirable possibilities. The use of TIA can make such uncertainties more clearly visible than can traditional methods.

## CROSS-IMPACT ANALYSIS

**Cross-impact analysis**, as mentioned earlier, is a technique used for examining the impacts of potential future events upon each other. It indicates the relative importance of specific events, identifies groups of reinforcing or inhibiting events, and reveals relationships between events that appear unrelated. In brief, cross-impact analysis provides a future forecast, making due allowance for the effect of interacting forces on the shape of things to come.

Essentially, this technique consists of selecting a group of five to ten project participants who are asked to specify critical events having any relationship with the subject of the analysis. For example, in an analysis of a marketing project, events may fall into any of the following categories:

1. Corporate objectives and goals.
2. Corporate strategy.
3. Markets or customers (potential volume, market share, possible strategies of key customers, etc.).
4. Competitors (product, price, promotion, and distribution strategies).
5. Overall competitive strategic posture, whether aggressive or defensive.
6. Internally or externally developed strategies that might affect the project.
7. Legal or regulatory activities having favorable or unfavorable effects.
8. Other social, demographic, or economic events.

The initial attempt at specifying critical events presumably will generate a long list of alternatives that should be consolidated into a manageable size (e.g., 25 to 30 events) by means of group discussion, concentrated thinking, elimination of duplications, and refinement of the problem. It is desirable for each event to contain one and only one variable, thus avoiding double counting. Selected events are represented in an  $n \times n$  matrix for developing the estimated impact of

each event on every other event. This is done by assuming that each specific event has already occurred and that it will have an enhancing, an inhibiting, or no effect on other events. If desired, impacts may be weighted. The project coordinator seeks impact estimates from each project participant individually and consolidates the estimates in the matrix form. Individual results, in summary form, are presented to the group. Project participants vote on the impact of each event. If the spread of votes is too wide, the coordinator asks those persons voting at the extremes to justify their positions. The participants are encouraged to discuss differences in the hope of clarifying problems. Another round of voting takes place. During this second round, opinions usually converge, and the median value of the votes is entered in the appropriate cell in the matrix. This procedure is repeated until the entire matrix is complete.

In the process of completing the matrix, a review of occurrences and interactions identifies events that are strong actors and significant reactors and provides a subjective opinion of their relative strengths. This information then serves as an important input in formulating strategy.

The use of cross-impact analysis may be illustrated with reference to a study concerning the future of U.S. automobile component suppliers. The following events were set forth in the study:

1. Motor vehicle safety standards that come into effect between 1992 and 1996 will result in an additional 150 pounds of weight for the average-sized U.S. car.
2. The 1993 NOX emissions regulations will be relaxed by the EPA.
3. The retail price of gasoline (regular grade) will be \$2 per gallon.
4. U.S. automakers will introduce passenger cars that will achieve at least 40 mpg under average summer driving conditions.

These events are arranged in matrix form in Exhibit 12-6. The arrows show the direction of the analysis. For example, the occurrence of Event A would be likely to bring more pressure to bear upon regulatory officials; consequently, Event B would be more likely to occur. An enhancing arrow is therefore placed in the cell where Row A and Column B intersect. Moving to Column C, it is not expected that the occurrence of Event A will have any effect on Event C, so a horizontal line is placed in this cell. It is judged that the occurrence of Event A would make Event D less likely to occur, and an inhibiting arrow is placed in this cell. If Event B were to occur, the consensus is that Event A would be more likely; hence the enhancing arrow. Event B is not expected to affect Event C but would make Event D more likely. Cells are completed in accordance with these judgments. Similar analyses for Events C and D complete the matrix.

The completed matrix shows the direction of the impact of rows (actors) upon columns (reactors). An analysis of the matrix at this point reveals that Reactor C has only one actor (Event D) because there is only one reaction in Column C. If interest is primarily focused on Event D, Column D should be studied for actor events. Then each actor should be examined to determine what degree of influence, if any, it is likely to have on other actors in order to bring about Event D.

**EXHIBIT 12-6**  
*Basic Format for Cross-Impact Matrix*

	If This Event Were to Occur	Then the Impact upon This Event Would Be			
		A	B	C	D
<b>A</b>	MVSS (1992 through 1996) requires 150 pounds additional weight for average-sized U.S. autos		↑	—	↓
<b>B</b>	1993 NO <sub>x</sub> emissions requirements are relaxed by EPA	↑		—	↑
<b>C</b>	Retail price of gasoline is \$2/gallon	↓	↑		↑
<b>D</b>	U.S. automakers introduce cars capable of 40 mpg in average summer driving	↑	↓	↓	

↑ = enhancing  
 — = no effect  
 ↓ = inhibiting

Next, impacts should be quantified to show linkage strengths (i.e., to determine how strongly the occurrence or nonoccurrence of one event would influence the occurrence of every other event). To assist in quantifying interactions, a subjective rating scale, such as the one shown on page 307, may be used.

<i>Voting Scale</i>	<i>Subjective Scale</i>	
+ 8	Critical: essential for success	<b>Enhancing</b>
+ 6	Major: major item for success	
+ 4	Significant: positive and helpful but not essential	
+ 2	Slight: noticeable enhancing effect	
<b>0</b>	<b>No effect</b>	
- 2	Slight: noticeable inhibiting effect	<b>Inhibiting</b>
- 4	Significant: retarding effect	
- 6	Major: major obstacle to success	
- 8	Critical: almost insurmountable hurdle	

Consider the impact of Event A upon Event B. It is felt that the occurrence of Event A would significantly improve the likelihood of the occurrence of Event B. Both the direction and the degree of enhancing impact are shown in Exhibit 12-7 by the +4 rating in the appropriate cell. Event A's occurrence would make Event D less likely; therefore, the consensus rating is -4. This process continues until all interactions have been evaluated and the matrix is complete.

There are a number of variations for quantifying interactions. For example, the subjective scale could be 0 to 10 rather than -8 to +8, as shown in the example above.

**EXHIBIT 12-7**  
*Cross-Impact Matrix Showing Degrees of Impact*

	If This Event Were to Occur	Then the Impact upon This Event Would Be			
		A	B	C	D
<b>A</b>	MVSS (1992 through 1996) requires 150 pounds additional weight for average-sized U.S. autos		+4	0	-4
<b>B</b>	1993 NO <sub>x</sub> emissions requirements are relaxed by EPA	+2		0	+4
<b>C</b>	Retail price of gasoline is \$2/gallon	-4	+4		+2
<b>D</b>	U.S. automakers introduce cars capable of 40 mpg in average summer driving	+2	-2	-2	

Another technique for quantifying interactions involves the use of probabilities. If the probability of the occurrence of each event is assessed before the construction of the matrix, then the change in that probability can be assessed for each interaction. As shown in Exhibit 12-8, the probabilities of occurrence can be entered in a column preceding the matrix, and the matrix is constructed in the conventional manner. Consider the impact of Event A on the probable occurrence of Event B. It is judged to be an enhancing effect, and the consensus is that the probability of Event B occurring will change from 0.8 to 0.9. The new probability is therefore entered in the appropriate cell. Event A is judged to have no effect upon Event C; therefore, the original probability, 0.5, is unchanged. Event D is inhibited by the occurrence of Event A, and the resulting probability of occurrence is lowered from 0.5 to 0.4. The occurrence of Event B increases the probability of Event A occurring from 0.7 to 0.8. Event B has no impact upon Event C (0.5, unchanged) and increases the probability of Event D to 0.7. This procedure is followed until all cells are completed.

An examination of the matrix at this stage reveals several important relationships. For example, if we wanted Event D to occur, then the most likely actors are Events B and C. We would then examine Columns B and C to determine what actors might be influenced. Influences that bring about desired results at a critical moment are often secondary, tertiary, or beyond. In many instances, the degree of impact is not the only important information to be gathered from a consideration of interactions. Time relationships are often very important and can be shown in a number of ways. For example, in Exhibit 12-8 information about time has been added in parentheses. It shows that if Event A were to occur, it would have an enhancing effect upon Event B, raising B's probability of occurrence from 0.8 to 0.9, and that this enhancement would occur immediately. If Event B were to occur, it would raise the probability of the occurrence of Event D from 0.5 to 0.7. It would also take two years to reach the probable time of occurrence of Event D.

**EXHIBIT 12-8**  
*Cross-Impact Matrix Showing Interactive Probabilities of Occurrence*

If This Event Were to Occur	Probability of Occurrence	Then the Impact upon This Event Would Be			
		A	B	C	D
<b>A</b> MVSS (1992 through 1996) requires 150 pounds additional weight for average-sized U.S. autos	0.7		0.9 (immed.)	0.5	0.4 (immed.)
<b>B</b> 1993 NO <sub>x</sub> emissions requirements are relaxed by EPA	0.8	0.8 (immed.)		0.5	0.7 (+2 yrs.)
<b>C</b> Retail price of gasoline is \$2/gallon	0.5	0.6 (+1 yr.)	0.9 (+1 yr.)		0.7 (+2 yrs.)
<b>D</b> U.S. automakers introduce cars capable of 40 mpg in average summer driving	0.5	0.8 (immed.)	0.6 (immed.)	0.4 (+1 yr.)	

## SCENARIO BUILDING

Plans for the future were traditionally developed on a single set of assumptions. Restricting one's assumptions may have been acceptable during times of relative stability, but as we enter the new century experience has shown that it may not be desirable to commit an organization to the most probable future alone. It is equally important to make allowances for unexpected or less probable future trends that may seriously jeopardize strategy. One way to focus on different future outcomes within the planning process is to develop scenarios and to design strategy so that it has enough flexibility to accommodate whatever outcome occurs. In other words, by developing multiple scenarios of the shape of things to come, a company can make a better strategic response to the future environment. Scenario building in this sense is a synopsis that depicts potential actions and events in a likely order of development, beginning with a set of conditions that describe a current situation or set of circumstances. In addition, scenarios depict a possible course of evolution in a given field. Identification of changes and evolution of programs are two stages in scenario building.

Changes in the environment can be grouped into two classes: (a) scientific and technological changes and (b) socioeconomic-political changes. Chapter 6 dealt with environmental scanning and the identification of these changes. Identification should take into consideration the total environment and its possibilities: What changes are taking place? What shape will change take in the future? How are other areas related to environmental change? What effect will change have on other related fields? What opportunities and threats are likely?<sup>13</sup>

A scenario should be developed without any intention of predicting the future. It should be a time-ordered sequence of events that reflects logical cause-

and-effect relationships among events. The objective of a scenario building should be to clarify certain phenomena or to study the key points in a series of developments in order to evolve new programs. One can follow an inductive or a deductive approach in building a scenario. The deductive approach, which is predictive in nature, studies broad changes, analyzes the impact of each change on a company's existing lines, and at the same time generates ideas about new areas of potential exploitation. Under the inductive approach, the future of each product line is simulated by exposing its current environment to various foreseen changes. Through a process of elimination, those changes that have relevance for one's business can be studied more deeply for possible action. Both approaches have their merits and limitations. The deductive approach is much more demanding, however, because it calls for proceeding from the unknown to the specific.

Exhibit 12-9 summarizes how scenarios may be constructed. Scenarios are not a set of random thoughts: They are logical conclusions based on past behaviors, future expectations, and the likely interactions of the two. As a matter of fact, a variety of analytical techniques (e.g., the delphi technique, trend impact analysis, and cross-impact analysis) may be used to formulate scenarios.

The following procedure may be utilized to analyze the scenarios:

- Identify and make explicit your company's mission, basic objective, and policies.
- Determine how far into the future you wish to plan.
- Develop a good understanding of your company's points of leverage and vulnerability.
- Determine factors that you think will definitely occur within your planning time frame.
- Make a list of key variables that will have make-or-break consequences for your company.
- Assign reasonable values to each key variable.
- Build scenarios in which your company may operate.
- Develop a strategy for each scenario that will most likely achieve your company's objectives.
- Check the flexibility of each strategy in each scenario by testing its effectiveness in the other scenarios.
- Select or develop an "optimum response" strategy.

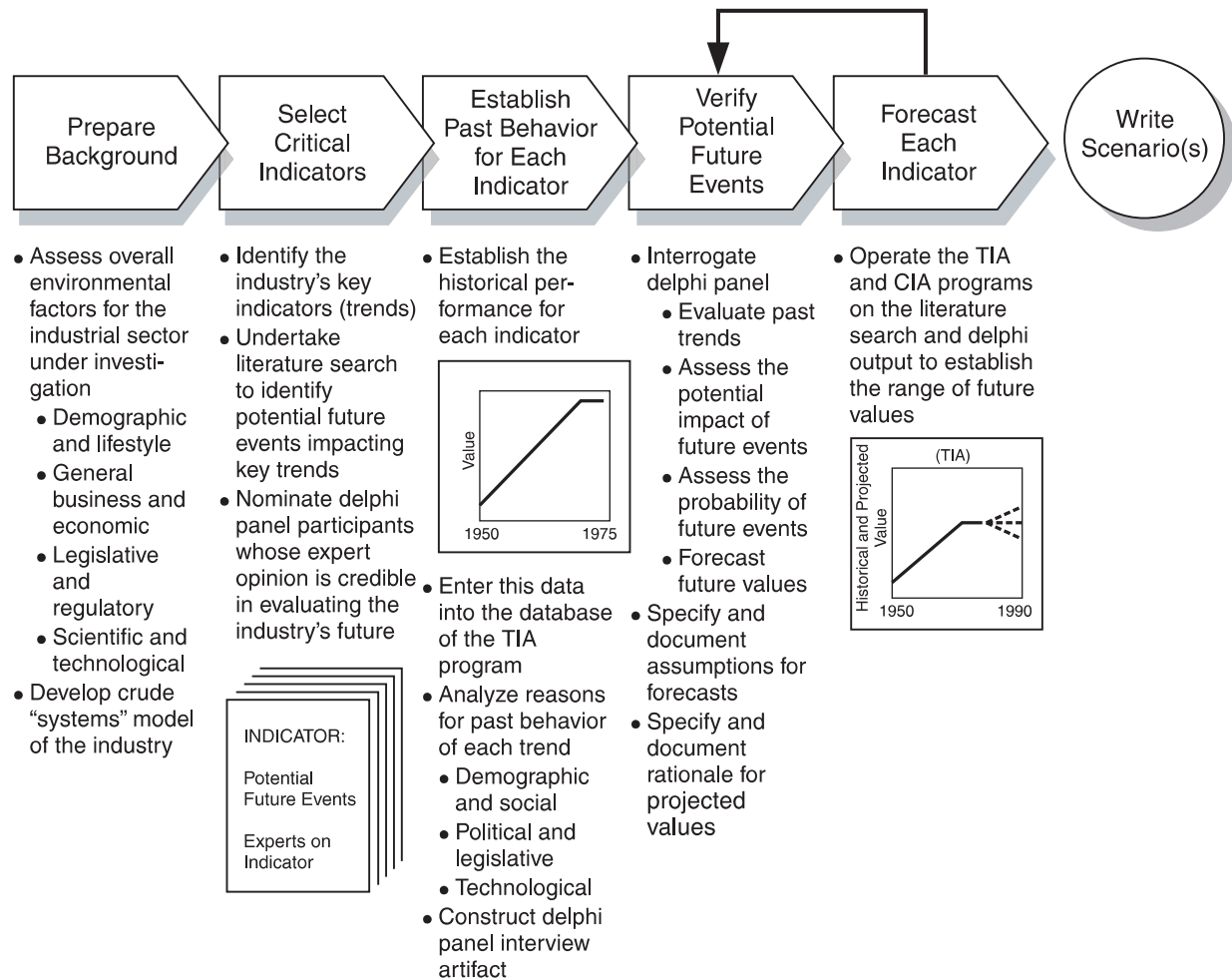
## OTHER TOOLS

Traditionally, tool usage was in favor of cost-reduction techniques. In recent years, the tool preferences are shifting toward models for retaining customers, outsmarting competitors, motivating employees, and accelerating innovation. Here is a listing of select new tools that are commonly used by strategists.

**Benchmarking.** This process measures a company against the standards and practices of other companies. The use of benchmarking is growing quickly among small companies, as it becomes easier to do due to the vast amount of information accessible through the web and availability of special software for benchmarking. Benchmarking falls into two main categories: (a) comparison of



**EXHIBIT 12-9**  
*Scenario-Building Method at GE*



financial measures, (b) qualitative and systematic search to identify the best practices of a relevant industry.

**Core competencies.** Core competencies are the capabilities of a firm or its product that are important in the eyes of customers and at the same time difficult to replicate by competition. In other words, a core competence has three traits:

1. It makes a contribution to perceived customer benefits.
2. It is difficult for competitors to imitate.
3. It can be leveraged to a wide variety of markets.

It is important to know that core competencies do change over time; thus companies must be proactive in developing new ones in response to market needs. Another trend that can be observed is that external relationship competencies are becoming more important than internal technological and process competencies.

**Customer satisfaction measurement.** Customer satisfaction measurement follows the perspectives of the marketing concept, i.e., first, firms need to be able to identify and understand customer needs; second, they need to be able to satisfy those needs. The customer satisfaction measurement is critical in evaluating how well the needs have been satisfied. A well-designed customer satisfaction measurement system has a direct and indirect impact in meeting many common business requirements: (a) design and development of a market-driven business plan; (b) design, analysis, and use of essential performance indicators; (c) product design and development; (d) assessment of the effectiveness of servicing; (e) continuous improvement; and (f) benchmarking.

There are 15 steps in the creation of an effective customer satisfaction measurement system. They include

1. Define the scope and purpose of the survey.
2. Determine the data collection method.
3. Determine how the data should be segmented by market, titles, etc.
4. Determine the appropriate sample sizes.
5. Determine the drivers of satisfaction.
6. Design the instrument to assess the relative importance of the drivers of customer satisfaction.
7. Develop a method to verify the buying criteria.
8. Develop open-ended questions.
9. Structure the competitive analysis section.
10. Develop the scale.
11. Test the instrument.
12. Pre-notify customers.
13. Administer the survey.
14. Develop the report.
15. Use the results and do it again.

**Pay for performance.** This system of compensation is tied to performance, as the name indicates. Although it may sound like a very straightforward system, the main challenge for compensation managers here is to tie the right rewards to the right outcomes. Issues that need to be taken under consideration in designing pay-for-performance plans are

1. Specific outcomes that should be measured
2. Competency-based pay programs for senior management compensation
3. Accounting and tax issues for stock and executive compensation programs
4. Retirement planning

**Reengineering.** Reengineering is a strategy of radically redesigning business processes to increase productivity. Specifically, reengineering often deals with

reassigning job tasks and downsizing. Some authors suggest that empowerment should be an important aspect of reengineering, while others argue that empowerment does not really increase performance because people have difficulty with defining their own jobs.

**Strategic alliances.** Many businesses today realize that they “can’t go it alone.” Thus, they form business partnerships with their customers, suppliers, or even competitors. Such alliances are not only present in the domestic market but also in the international arena (joint ventures). The main issue here is: Are alliances a successful method of conducting business? Many of them fail—this brings up a challenge of identifying the success and failure factors in such ventures.

**Total Quality Management.** Total Quality Management (TQM) is a management technique that focuses on continuous improvement of business operations and practices to eliminate errors (thus improve quality and cut costs) and improve quality of customer satisfaction. Several success factors have been identified for TQM, among others:

1. Process focus (improving how things should be done to make them better)
2. Systematic and continuous improvement
3. Company-wide emphasis
4. Customer focus (e.g., quality defined from the customer perspective)
5. Employee involvement and development
6. Cross-functional management
7. Supplier relationships
8. Recognition of TQM as a critical competitive strategy

## SUMMARY

This chapter presented a variety of tools and techniques that are helpful in different aspects of strategy formulation and implementation. These tools and techniques include experience curves, the PIMS model, a model for measuring the value of marketing strategies, game theory, the delphi technique, trend-impact analysis, cross-impact analysis, and scenario building. Most of these techniques require data inputs both from within the organization and from outside. Each tool or technique was examined for its application and usefulness. In some cases, procedural details for using a technique were illustrated with examples from the field.

## DISCUSSION QUESTIONS

1. Explain the relevance of experience curves in formulating pricing strategy.
2. Discuss how the delphi technique may be used to generate innovative ideas for new types of distribution channels for automobiles.
3. Explain how PIMS judgments can be useful in developing marketing strategy.
4. Experience curves and the PIMS model both seem to imply that market share is an essential ingredient of a winning strategy. Does that mean that a company with a low market share has no way of running a profitable business?

5. One of the PIMS principles states that quality is the most important single factor affecting an SBU's performance. Comment on the link between quality and business performance.

## NOTES

- <sup>1</sup> *Perspective on Experience* (Boston: Boston Consulting Group, 1970): 1. See also James Aley, "The Theory That Made Microsoft," *Fortune* (29 April 1996): 65.
- <sup>2</sup> See John Dutton and Annie Thomas, "Treating Progress Functions as a Managerial Opportunity," *Academy of Management Review* (April 1984).
- <sup>3</sup> See Richard Minter, "The Myth Of Market Share," *The Wall Street Journal* (15 June 1998): A17. See also William W. Alberts, "The Experience Curve Doctrine Reconsidered," *Journal of Marketing* (July 1989): 36–49; and Robert Jacobson, "Distinguishing among Competing Theories of the Market Share Effect," *Journal of Marketing* (October 1988): 68–80.
- <sup>4</sup> Vijay Vishwahath and Jonathon Mark, "Your Brand's Best Strategy," *Harvard Business Review* (May–June, 1997): 123–131.
- <sup>5</sup> Robert D. Buzzell and Robert T. Gale, *The PIMS Principles: Linking Strategy to Performance* (New York: The Free Press, 1987): 2.
- <sup>6</sup> Robert Jacobson and David A. Aaker, "Is Market Share All It's Cracked Up to Be?" *Journal of Marketing* (Fall 1985): 11–22. See also John E. Prescott, Ajay K. Kohli, and N. Venkatraman, "The Market Share-Profitability Relationship: An Empirical Assessment of Major Assertions and Contradictions," *Strategic Management Journal* 7 (1986): 377–394.
- <sup>7</sup> See Cheri T. Marshall and Robert D. Buzzell, "PIMS and the FTC Line-of-Business Data: A Comparison," *Strategic Management Journal* 11 (1990): 269–282.
- <sup>8</sup> Buzzell and Gale, *PIMS Principles*, 192–193. Also see V. Ramanujan and N. Venkatraman, "An Inventory and Critique of Strategy Research Using the PIMS Data Base," *Academy of Management Review* (January 1984): 138–151.
- <sup>9</sup> George S. Day and Liam Fahey, "Valuing Market Strategies," *Journal of Marketing* (July 1988): 45–57.
- <sup>10</sup> Sharon Tully, "The Real Key to Creating Wealth," *Fortune* (20 September 1993): 38. Also see Laura Walbert, "America's Best Wealth Creators," *Fortune* (27 December 1993): 64.
- <sup>11</sup> See Bala Chakravarthy and Worth Loomis, "Dexter Corporation's Value-Based Strategic Planning System," *Planning Review* (January–February 1988): 34–41.
- <sup>12</sup> F. William Barnett, "Making Game Theory Work in Practice," *The Wall Street Journal* (13 February 1995): B8.
- <sup>13</sup> Frank Rutolo, "Scenarios: Moving Beyond Survival Toward Prosperity," *Outlook* (November 1994).

## APPENDIX

### *Experience Curve Construction*

The experience curve concept can be used as an aid in developing marketing strategy. The procedure for constructing curves discussed below describes how the relationship between costs and accumulated experience can be empirically developed.

The first step in the process of constructing the experience curve is to compute experience and accumulated cost information. Experience for a particular year is the accumulation of all volume up to and including that year. It is computed by adding the year's volume to the experience of previous years. Accumulated cost (constant dollars) is the total of all constant costs incurred for the product up to and including that year. It is computed by adding the year's constant dollar cost to the accumulated costs of previous years. A year's constant dollar cost is the real dollar cost for that year, corrected by inflation. It is computed by dividing cost (actual dollars) by the appropriate deflator.

The second step is to plot the initial and annual experience/accumulated cost (constant dollars) data on log-log graph paper (see Exhibit 12-A). It is important that the experience axis of this graph be calibrated so that its point of intersection with the accumulated cost axis is at one unit of experience. The accumulated cost axis may be calibrated in any convenient manner.

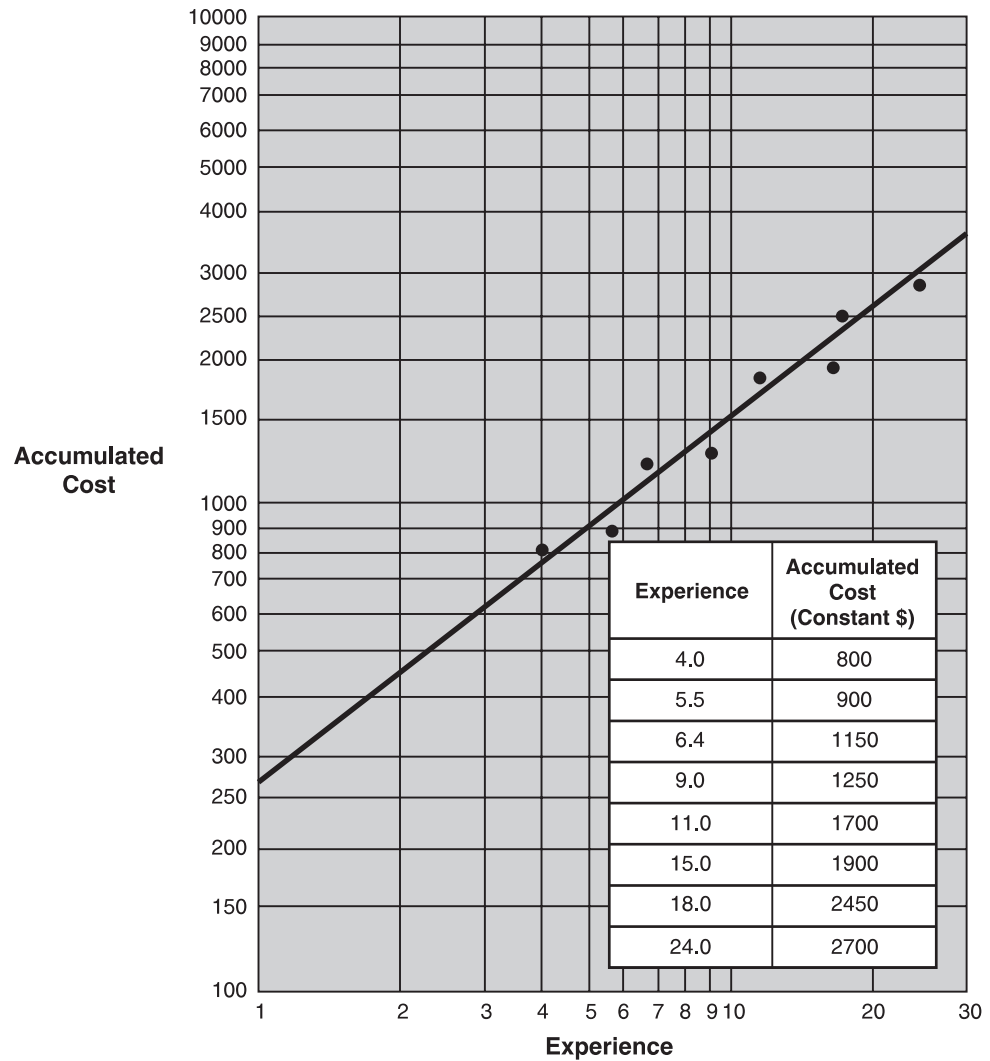
The next step is to fit a straight line to the points on the graph, which may be accomplished by using the least-squares method (Exhibit 12-A).

It is useful at this point to stop and analyze the accumulated cost diagram. In general, the closer the data points are to the accumulated cost curve, the stronger the evidence that the experience effect is present. Deviations of the data points from the curve, however, do not necessarily disprove the presence of the experience effect. If the deviations can be attributed to heavy investment in plant, equipment, etc. (as is common in very capital-intensive industries), the experience effect still holds, but only in the long run because, in the long run, the fluctuations are averaged out. If, on the other hand, significant deviations from the line cannot be explained as necessary periodic changes in the rate of investment, then the presence of the experience effect, or at least its consistency, is open to question. In Exhibit 12-B (page 328) there is one deviation (see Point X) that stands out as significant. If this can be ascribed to heavy investment (in plant, equipment, etc.), the experience effect is still viable here.

The next step in the process of constructing the experience curve is to calculate the intensity of the product's experience effect. Intensity is the percentage in unit cost reduction achieved each time the product's experience is doubled. As such, it determines the slope of the experience curve. To compute the intensity from the accumulated cost curve, arbitrarily select an experience level on the experience axis (e.g., Point  $E_1$  in Exhibit 12-C). Draw a line vertically up from  $E_1$  until it intersects the accumulated cost curve. From that point on the curve, draw a horizontal line left until it intersects the accumulated cost axis. Read the corresponding accumulated cost ( $A_1$ ) from the scale. Follow the same procedure for experience level  $E_2$ , where  $E_2$  equals  $E_1 \times 2$ , to obtain  $A_2$ . Divide  $A_2$  by  $A_1$ , divide the result by 2, and subtract the second result from the number 1. The final answer is the product's intensity. With the information given in Exhibit 12-C, the intensity equals 16.7 percent:

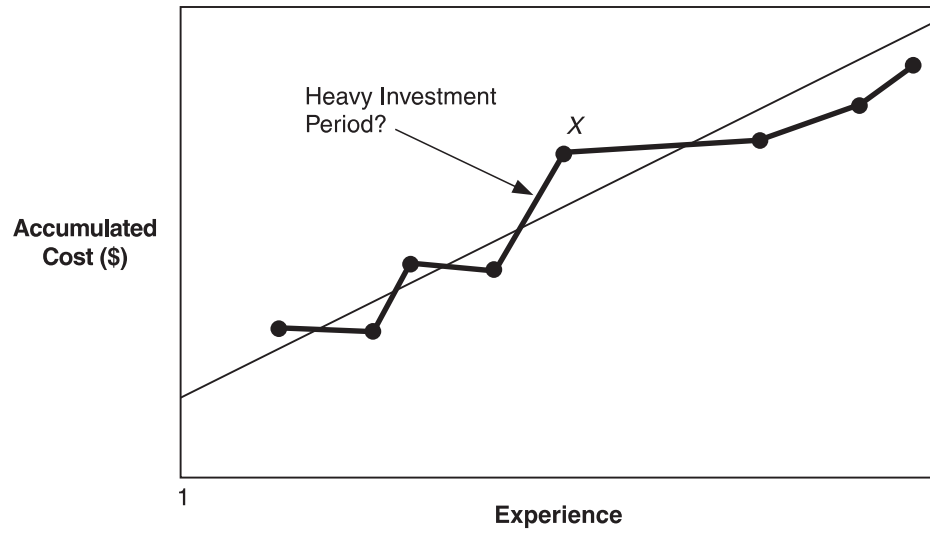
When the intensity has been computed, the slope of the experience curve is determined. However, as shown in Exhibit 12-D (page 329), this information in itself is not sufficient for constructing the curve. Because all of the lines in Exhibit 12-D are parallel, they have the same slope and represent the same intensity. To

**EXHIBIT 12-A**  
*Accumulated Cost Diagram*

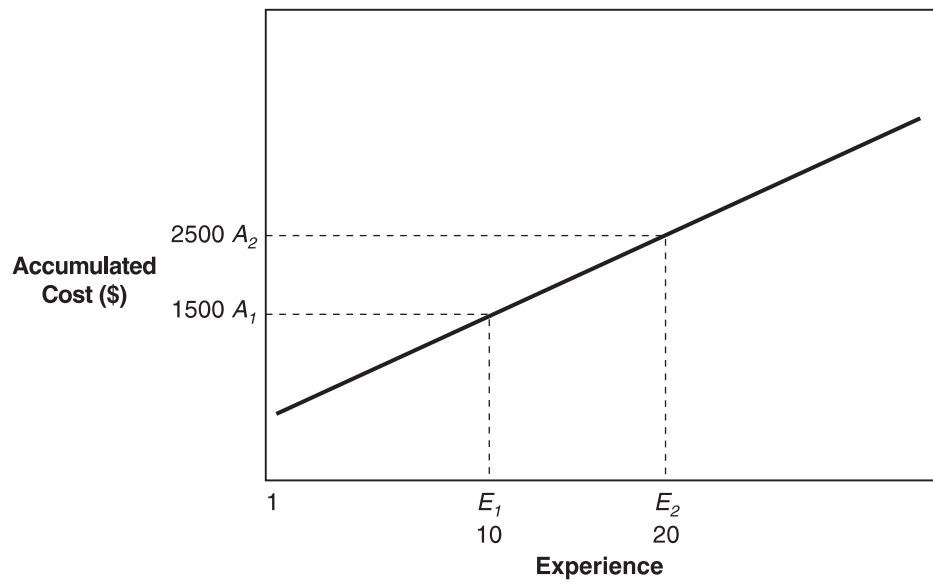


construct the experience curve, it is necessary to find a point ( $C_1$ ) on the unit cost axis. This can be achieved in the following manner: Find the *intensity multiplier* corresponding to the product's intensity from the table specially prepared for the purpose (Exhibit 12-E, page 330). If the intensity falls between two values in Exhibit 12-E, the appropriate intensity multiplier should be determined by implementation and control interpolation. Read the value on the accumulated cost axis where the curve intersects that axis. Multiply this value by the intensity multiplier. The result is  $C_1$ .

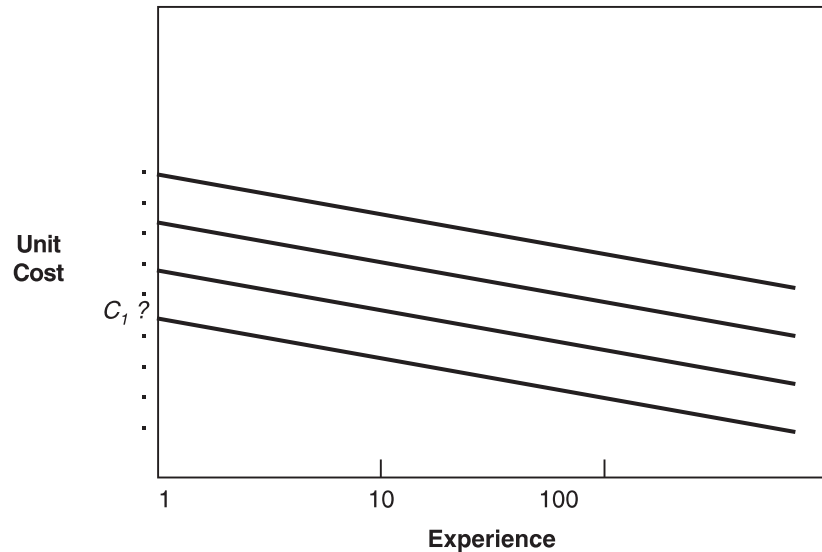
**EXHIBIT 12-B**  
*Interpretation of Deviations from Accumulated Cost Curve*



**EXHIBIT 12-C**  
*Product Intensity Computation*



**EXHIBIT 12-D**  
*Slopes of Parallel Lines*



The intensity was calculated above as 16.7 percent. By using Exhibit 12-E, the corresponding intensity multiplier can be interpolated as approximately 0.736. As shown in Exhibit 12-A, the accumulated cost at the point of intersection can be read as approximately \$260. Multiplying \$260 by 0.736 yields a  $C_1$  of \$191. The experience curve can now be plotted on log-log graph paper. Position  $C_1$  on the unit cost axis. Multiply  $C_1$  by the quantity  $(1 - \text{intensity})$  to obtain  $C_2$ :

$$\$191 \times (1 - 0.167) = \$159$$

Locate  $C_2$  on the unit cost axis. Find the point of intersection ( $y$ ) of a line drawn vertically up from 2 on the experience axis and a line drawn horizontally right from  $C_2$  on the unit cost axis. Draw a straight line through the points  $C_1$  and  $y$ . The result is the product's experience curve (Exhibit 12-F, page 331).

The application of the experience curve concept to marketing strategy requires the forecasting of costs. This can be achieved by using the curve. Determine the current cumulative experience of the product. Add to this value the planned cumulative volume from the present to the future time point. The result is the planned experience level at that point. Locate the planned experience level on the experience axis of the graph. Move vertically up from that point until the line extension of the experience curve is reached. Move horizontally left from the line to the unit cost axis. Read the estimated unit cost value from the



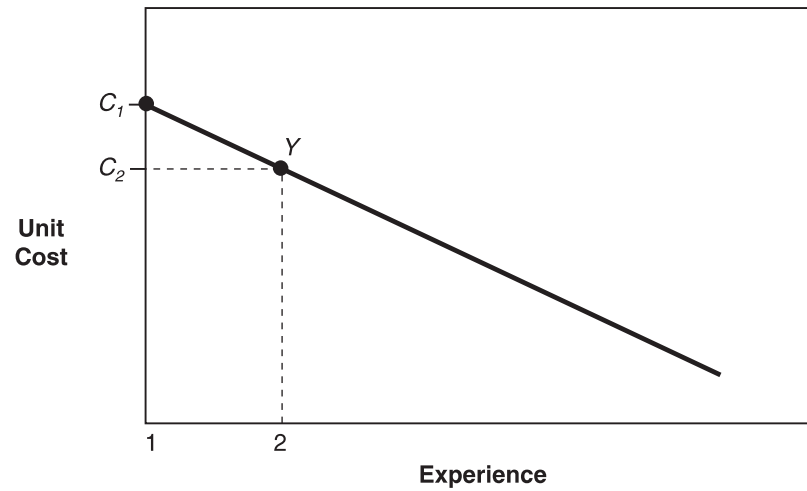
**EXHIBIT 12-E**  
*Intensity Multipliers*

<i>Intensity</i>	<i>Intensity Multiplier</i>	<i>Intensity</i>	<i>Intensity Multiplier</i>
5.0%	.926	20.5%	.669
5.5	.918	21.0	.660
6.0	.911	21.5	.651
6.5	.903	22.0	.642
7.0	.895	22.5	.632
7.5	.888	23.0	.623
8.0	.880	23.5	.614
8.5	.872	24.0	.604
9.0	.864	24.5	.595
9.5	.856	25.0	.585
10.0	.848	25.5	.575
10.5	.840	26.0	.566
11.0	.832	26.5	.556
11.5	.824	27.0	.546
12.0	.816	27.5	.536
12.5	.807	28.0	.526
13.0	.799	28.5	.516
13.5	.791	29.0	.506
14.0	.782	29.5	.496
14.5	.774	30.0	.485
15.0	.766	30.5	.475
15.5	.757	31.0	.465
16.0	.748	31.5	.454
16.5	.740	32.0	.444
17.0	.731	32.5	.433
17.5	.722	33.0	.422
18.0	.714	33.5	.411
18.5	.705	34.0	.401
19.0	.696	34.5	.390
19.5	.687	35.0	.379
20.0	.678	35.5	.367

scale. The unit cost obtained is expressed in constant dollars, but it can be converted to an actual dollar cost by multiplying it by the projected inflator for the future year.

Cost forecasts can also be used to determine the minimum rate of volume growth necessary to offset an assumed rate of inflation. For example, with an assumed inflation rate of 3.8 percent, a producer having an intensity of 20 percent must realize a volume growth of approximately 13 percent per year just to maintain unit cost in real dollars. Should growth be slower or should full cost-reduction potential not be realized, the producer's unit cost would rise.

EXHIBIT 12-F  
*Experience Curve Estimation*



Competitor cost is one of the most fundamental yet elusive information needs of the producer attempting to develop marketing strategy. The experience curve concept provides a sound basis for estimating the cost positions of competitors as well. With certain assumptions, competitors' curves can be estimated.