



The **microeconomics** of industry supply

Understanding your industry's cost structure can give you a powerful competitive advantage. And if you happen to be in a manufacturing business, it can dramatically improve your capacity and production decisions.

Cost is an essential consideration in any business strategy. Running a company in an efficient way is the bread and butter of traditional management, but in some industries, assessing your cost position against the positions of your competitors can have more explicitly strategic implications that are often best understood using concepts from game theory. Understanding a rival's costs often amounts to understanding its supply curve—the amount of goods the organization will produce at a given price and, by extension, the price at which its managers might choose to exit the industry entirely.

In 1980 Carter Bales, P. C. Chatterjee, Donald Gogel, and Anupam Puri published a staff paper outlining a rigorous approach for determining how to achieve and sustain a cost advantage. Their paper, “Competitive cost analysis,” introduced the concept of the business system and went on to show how strategists might use this deceptively simple tool to help companies become cost leaders. Later that year, in a *McKinsey Quarterly* article, Fred Gluck provided a broader description of how the business system concept could be used to help formulate strategy. Gluck's article—“Strategic choice and resource allocation”—was referred to by Michael Porter in his 1985 book,

This article can be found on our Web site at www.mckinseyquarterly.com/strategy/miin00.asp.

Competitive Advantage, which described his concept of the value chain. For this anthology, the Firm’s strategy practice has written a new article, entitled “The business system: A new tool for strategy formulation and cost analysis,” adapted from the “Competitive cost analysis” staff paper and from Gluck’s *Quarterly* article.

In 1981, a year after “Competitive cost analysis” was written, Don C. Watters wrote a staff paper introducing the cost curve as a model for analyzing the strategic decisions about capacity and production that players in heavy, high-fixed-cost industries have to make. Originally developed in McKinsey’s San Francisco office by Ted Hall and others, the model presented in Watters’s paper, “The industry cost curve as a strategic tool,” is still a mainstay of McKinsey’s work in such industries.



The business system: A new tool for strategy formulation and cost analysis

Carter F. Bales, P. C. Chatterjee, Frederick W. Gluck, Donald Gogel, and Anupam Puri

One definition of strategy at the business unit level—a definition that fits many companies’ needs—is “an integrated set of actions designed to gain a sustainable advantage over competitors.” Both parts of this definition are important. In military terms, “sustainable advantage over competitors” means that you not only win the hill but also hold it. Gaining a sustainable advantage on the corporate battlefield usually requires more than simply playing the game better by the existing rules of the industry; you must change the ground rules yourself.¹ The definition’s other key phrase—“an integrated set of actions”—is highlighted by the concept of the business system, which is proving to be a powerful framework for putting together such a set of actions to achieve a sustainable competitive advantage.

¹See Roberto Buaron, “New-game strategies,” on page 34 of this anthology.

This article is adapted from “Competitive cost analysis,” a McKinsey staff paper dated January 1980, and from “Strategic choice and resource allocation,” which was originally published in *The McKinsey Quarterly*, Winter 1980. Copyright © 1980, 2000 McKinsey & Company. All rights reserved. The authors of both articles are alumni of McKinsey’s New York office, except **Anupam Puri**, who is a director there.

EXHIBIT 1

Business system for a technology-based manufacturing company

The concept is based on a sequential chart showing the key elements of the system by which a business delivers its products or services to a market or market segment. For example, in a technology-based manufacturing company, these system elements might be technology, product design, manufacturing, marketing, distribution, and service (Exhibit 1). At each link of the business system, management can choose how to conduct the business.

The business system concept encourages managers to ask **option-generating questions** at each stage of the process

The business system concept pushes dialogue beyond the constraints imposed in a normal business-planning review process. It encourages managers to ask option-generating questions concerning each stage of the business system. Such questions include the following:

- How am I performing this function? Is there a better way to do it? What are the outer limits to what I can do here?
- Will—or should—changes in the external environment affect the way I perform this function?
- How does my competitor perform this function? Is the competitor's way better than mine? Does it cost less? Does it provide more value to customers?
- How does what I am doing at this stage fit in with what I am doing at other stages in the business system? Do I really have an integrated strategy?

A key point the business system suggests is that there are many ways to gain a strategic advantage other than through product innovation. Some of the most exciting success stories have hinged not on inventing a new product but rather on changing the conventional system for getting an existing

product to market. Consider just one example. Hanes Corporation, which had been making women's stockings for years, one day asked itself if there was any reason high-quality stockings shouldn't be marketed through grocery and discount stores. There wasn't, so Hanes did it. The company's imaginatively packaged Leggs line quickly built a leading market share.

This example illustrates how dissecting the business system can reveal new strategic opportunities in a business you are already in. It can also help you identify expansion or diversification opportunities that permit you to build on an existing set of strengths. One leading manufacturer of dictating machines, Lanier Business Products, used its strength in marketing to sell stand-alone word processors successfully. Instead of making word processors, the company sourced them from another manufacturer. The products were not leading-edge. But Lanier used its advertising and marketing muscle to transform an intimidating high-technology machine into the secretary's best friend. The firm called its machine "No Problem," differentiating it from rival models, with names consisting of scientific-sounding strings of letters and numbers.

Dissecting the business system can help **identify opportunities** that permit your business to build on an existing set of strengths

The business system concept can also serve as a tool for evaluating acquisitions, and it proves to be much more powerful in that

respect than financial criteria alone. Consider Philip Morris's successful acquisition of Miller Beer. Until then, what separated the winners from the losers in the beer business had been manufacturing efficiencies of control and distribution. Philip Morris saw the opportunity to apply cigarette marketing techniques to beer. For example, it saturated prime-time TV with advertising and introduced new products such as Miller Lite to appeal to different market segments. By creating competitive advantage in the *marketing* link of the beer industry's business system, Philip Morris changed the rules of the game.

The business system has also proved extremely powerful as a tool for developing strategies built on cost as a competitive advantage. A strong competitive cost advantage is a versatile and often decisive strategic asset. To a company seeking to create or maintain such an advantage, an accurate understanding of relative costs is the soundest possible starting point. Building a cost advantage, however, is no easy task. Many companies have tried to use shortcuts to understand their relative cost positions, but these shortcuts, including the well-known experience curve, have proved to be less than satisfactory in practice.

We have developed an approach, called *competitive cost analysis*, that analyzes costs at the level of the total business system. This process aims to clarify the basic cost structure of the industry, to pinpoint the key cost elements affecting competitive position, to explore the ways the cost structure could be changed by altering the business system, and to identify alternative business systems and competitors to be assessed in greater depth. Competitive cost analysis has two main aspects: business-system cost analysis and targeted-competitor cost analysis.

The business system is a powerful tool that can help a company to create a truly **integrated strategy**

To analyze the cost of your company's business system, you must:

1. Chart the company's costs at each link in the business system.
2. Identify cost-restructuring options by evaluating ways to reconfigure activities at each link in the business system.
3. Estimate how costs will vary at each link in the system under each possible reconfiguration.
4. Arrange in all possible ways the various configurations of each critical link in the system to identify the lowest-cost business system that can be constructed.
5. Compare this low-cost business system with competitors' cost positions to confirm that you really have constructed a superior competitive cost position.

At the end of this analysis, you may have to target some competitors for more detailed comparative cost analyses. Here again, the business system is a vital framework for gaining insight into all stages of a competitor's cost structure.

Whether the strategist wants to build powerful "new-game" strategies, to evaluate acquisitions, or to build a decisively superior cost position, the business system is an extremely powerful tool that can help a company create a truly *integrated* strategy, one in which its activities at each link of the system are tightly aligned with its overall strategic direction.



The **industry** cost curve as a **strategic tool**

Don C. Watters

Many managers at manufacturing companies still rely on “gut feel” to make important decisions on capacity and production. In many industries, though, price and profit are determined directly by three factors: the production capacities of the various producers, production costs, and demand for the product. Thus, there is no reason to leave huge, irreversible investment decisions to the vagaries of intuition. Instead, managers should use the industry cost curve—a simple analytical framework that makes plain the link between price and profit, on one hand, and demand, capacity, and cost, on the other.

The industry cost curve is really just the standard microeconomic graph that shows how much output suppliers can produce at a given cost per unit. As a strategic tool, the cost curve applies most directly to commodity or near-commodity industries, in which buyers get roughly the same value from a product regardless of who produces it. But the curve also applies when the value of products from various suppliers differs in consistent, predictable ways.

To illustrate the industry cost curve, let us look at the market for yellow writing pads—a product all too familiar to consultants. For a given year, assume that demand is 75,000 tons, regardless of price. Before drawing the cost curve, you should list all existing paper mills, their production capacities, and their per-unit costs as well as any potential new mills or expansions of existing ones. Draw the curve as shown in Exhibit 2, starting with the lowest-cost plant at the left and progressing through successively higher-cost facilities. In a well-functioning market, the lowest-cost plant will produce as much as it can, as will the second-lowest-cost plant and so on, until demand is completely satisfied. Any higher-cost plants that are not needed to meet demand will be priced out of the market.

According to the cost curve in Exhibit 2, there are currently four paper mills capable of producing yellow notepads: two owned by the Alpha Company,

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one by the Bravo Company, and one by Romeo Inc. At the moment, Romeo’s \$1,000-a-ton mill is mothballed, and Bravo is thinking about building a brand-new facility, Bravo 2, which would have costs of \$1,200 a ton. At Alpha’s most efficient mill, called Alpha 1, production costs are \$700 a ton. At Bravo 1, they are \$750 a ton. And so on.

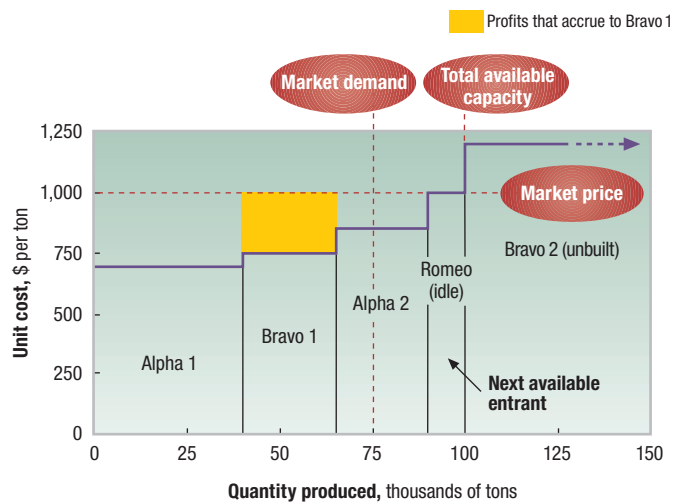
One of the key insights of this exercise is that the market price is set at the cost of the next available entrant over and above those needed to satisfy current demand. For instance, since demand for notepads is 75,000 tons, only three mills are needed to supply the entire market: Alpha 1 running at capacity, Bravo 1 running at capacity, and Alpha 2 producing 10,000 tons of a potential 25,000.

What is the market price? Well, it may bounce around for a while, but it will ultimately settle down at around \$1,000. Suppose, for instance, that Alpha were to set the price of its output above \$1,000. In that case, the Romeo mill, which is now idle, would enter the market and steal some of Alpha’s sales. But as long as Alpha keeps its prices under \$1,000, it doesn’t have to worry about new entrants. In particular, if Alpha sets its price just barely below \$1,000—say, at \$999—buyers will have to pay that price.² Thus, all three mills set their prices at around \$1,000, plus or minus a few dollars. The operating profit of each mill is simply quantity \times (price $-$ cost), which shows up as the area of a rectangle on the cost curve. The yellow box in Exhibit 2, for example, shows the profits that accrue to Bravo 1.

The tricky part is getting the costs right. Let us consider a mill, such as Bravo 2, that hasn’t yet been built. To calculate its costs, begin with the cash cost of producing a ton of notepads and then add the per-unit costs of transporting the pads to their destination (assuming that the supplier does the shipping). Last, include the opportunity cost of the mill: the return on a similarly

EXHIBIT 2

Cost curve for the yellow writing-pad industry




²Bravo could afford to underprice Alpha, by charging less than \$999, but that wouldn’t make any sense since Bravo 1 is already running at capacity and can’t handle any more demand.

risky investment the company could make with the money required to build the mill. Opportunity costs are critical: Bravo 2 will not be built if the Bravo Company doesn't believe that it can at least earn an acceptable return on its capital.

What about a mill, such as Bravo 1, that is already built? Most of Bravo 1's capital costs are sunk: since the money has already been spent, Bravo cannot invest it elsewhere. So the only opportunity cost at Bravo 1 is the cost of the working capital tied up in running the mill. Per-unit costs, then, are equal to the cash costs of production plus transport costs and the opportunity cost of the mill's working capital.

Just by looking at the cost curve, you can learn some important lessons about manufacturing. For instance, even though Bravo 1 is an efficient producer, the company may not want to expand capacity there. Doing so could drive the higher-cost Alpha 2 out of the market, thus driving the price down, a development that would hurt Bravo 1 more than the additional tonnage sold would help it.³

Conversely, consider what would happen if a producer such as Alpha were to remove a bit of high-cost capacity from the market—say, by shutting down the Alpha 2 mill. Suddenly, Romeo's mill would have to enter the market to soak up Alpha 2's sales. The market price would rise to \$1,200—the cost of production at the unbuilt Bravo mill—causing the Alpha 1 mill to earn far higher profits. Thus, from Alpha's point of view, shutting down Alpha 2 wouldn't be such a bad idea.

Of course, in reality, few markets are as simple as the one we have described. A single plant may be able to churn out several different types of product, each serving a number of distinct market segments with varying levels of demand. And a given plant's capacity to produce item A is rarely fixed, depending rather on how many units of items B, C, and D the plant produces at the same time. One strength of the industry cost curve approach is that it helps solve such complex problems. Given approximate cost and demand information, off-the-shelf linear-optimization software can find the capacity and production choice, for each plant and product, that will maximize your company's total profit. The days of gut feel are over. 

³If Alpha 2 were forced to close, the market price would drop to \$850, which is Alpha 2's cost—in other words, the cost of the next available entrant.