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Industrial Pricing: Theory and Managerial Practice

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Abstract

We organize the existing theoretical pricing research into a new two-level framework for industrial goods pricing. The first level consists of four pricing situations: New Product, Competitive, Product Line, and Cost-based. The second level consists of the pricing strategies appropriate for a given situation. For example, within the new product pricing situation, there are three alternative pricing strategies: Skim, Penetration, and Experience Curve pricing. There are a total of ten pricing strategies included in the framework.

We then identified a set of cost, product, market, and information conditions which determine what pricing situation(s) a firm is facing as well as which strategies are appropriate within a given situation. Some of these determinant conditions are common to many pricing strategies (e.g., highly elastic demand) while others are unique to a given strategy within a particular pricing situation. For example, within the product line situation, the profitability of supplementary sales is a unique determinant of the Complementary Product pricing strategy (razor-and-blade pricing). Using this framework as a basis for an empirical study, we examined how well current industrial pricing practice matches the prescriptions from the existing research.

Our sample consisted of 270 respondents (27% response rate). Of these, more than 50% indicated that they used more than one pricing strategy in formulating their most recent pricing decision for a high-value industrial product sold in the United States. As in previous research, Cost-Plus pricing was the most often cited pricing strategy (56% of the respondents).

Since the respondents were able to indicate their use of more than one pricing strategy, the data are of the "pick k from n" variety. In order to model the managers' pricing strategy choices, we constructed a "stacked" binary logit with a separate observation for each strategy within a given pricing situation. The signs of the determinant variables were estimated as interaction terms.

The new product pricing strategies (skim, penetration, experience curve) were used for new models in the market. Skim pricing was used in markets with high levels of product differentiation by firms at a cost disadvantage due to scale. Penetration pricing was used by firms with a cost advantage due to scale in markets with high level of overall elasticity but low brand elasticity. Experience curve pricing was used for minor innovations by firms with low capacity utilization in markets with a high level of differentiation.

The competitive pricing strategies (Leader, Parity, and Low-price Supplier) were used in mature markets. Parity pricing was used by firms in a poor competitive situation, i.e., high costs, low market share, low product differentiation. These firms were also unable to take advantage of high levels of elasticity since their capacity utilization was high. In contrast, the low-price supplier strategy was used by firms with low costs due to scale advantages. Since they have low utilization, these firms can take advantage of elastic brand demand. None of the determinants were significantly related to the choice of leader pricing.

Product line pricing strategies (Bundling, Complementary Product, and Customer Value pricing) were more likely to be used by firms which sell substitute or complementary products. Bundle pricing was used for per-sale/contract pricing in markets with high levels of brand elasticity. Complementary product pricing (razor-and-blade) was used by firms that enjoyed high profitability on its supplementary sales. Using customer value pricing, a firm offers a stripped down version of its current products to appeal to more price sensitive segments or to leverage new distribution channels. This strategy was used to target a narrow segment in high growth markets where price changes are difficult to detect.

Cost-based pricing was more likely to be used in markets where demand is very difficult to estimate. In such a situation, cost-based pricing makes a great deal of sense.

In general, the results show that the managers' pricing strategy choices are consistent with normative pricing research. However, questions about how managers combine their strategies to arrive at a final price as well as the organizational influences on pricing strategies remain important areas for future research.

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Introduction

There has been a great deal written on what pricing strategies managers should follow under various market, competitive, and cost conditions (e.g., Guiltinan et al. 1997, Nagle and Holden 1995, Schoell and Guiltinan 1995, Tellis 1986). However, there have been few studies of how these prescriptions match actual practice (Lillien et al. 1992, p. 212). The existing research is primarily concerned with how frequently different pricing strategies are used in industry (Udell 1972, Abratt and Pitt 1985, Morris and Pitt 1993). The purpose of this study is to improve our understanding of the factors that determine which pricing strategies are used by managers in industrial markets.

Using a national mail survey, we questioned managers about their most recent pricing decisions for capital goods sold in U.S. markets. We asked these managers to indicate which pricing strategy or strategies they used. We also collected extensive information on the internal and external conditions at the time of the pricing decision. Using a "stacked" binary logit model formulation, we analyzed the relationships between the managers' pricing environments and their choices of pricing strategies.

This study makes three important contributions to the pricing literature. First, we organize the normative pricing research into a new, two-level framework that highlights the common and unique determinants of ten widely studied pricing strategies. Second, this is the most comprehensive study of recent industrial pricing practice. Our data provides important benchmarking information for managers about what pricing strategies other companies are using in similar situations. Third, we analyze the relationships between the pricing environment and the managers' choices of pricing strategies. In general, our results are in the direction predicted by the normative theory.

In the next sections, we first discuss prior empirical pricing research and then we organize the normative research on pricing strategies and their determinants. We follow with the analysis of the results from our survey of pricing managers. We conclude with a discussion of this study and directions for future research.

Related Empirical Research on Pricing

Most of the empirical research investigating how managers set prices has focused on identifying the objectives used by managers in pricing decisions (Diamantopoulos 1991). The major studies (Kaplan et al. 1958, Shipley 1981, Jobber and Hooley 1987, Samiee 1987, Coe 1983, 1988, 1990, and Diamantopoulos and Mathews 1994) have shown that profit maximization is used by many firms, but it is clearly not dominant across all firms (Diamantopoulos 1994). These studies also show that most firms use multiple pricing objectives, the objectives change over time (Coe 1983, 1988, 1990) and the choice of objective is related to the pricing environment of the firm (Diamantopoulos and Mathews 1994).

The study of pricing objectives can provide information on *what* the firm is trying to accomplish, but objectives do not tell us much about *how* the firm will accomplish those objectives. These studies do not address the issue of what pricing strategies will be used to accomplish the goals of the firm. For the purpose of this study, objectives are defined as the results a decision maker seeks to achieve (e.g., profit maximization). A pricing strategy is the *means* by which a pricing objective is to be achieved. Most pricing strategies imply a relative price level or schedule related to costs, competition, or customers. Determinants are the internal and external conditions that determine managers' choices of pricing strategies.

A brief example may help distinguish these constructs. Consider a firm with a pricing objective of maximizing profitability for a new product. In one scenario, customers might be insensitive to price and the products in this market are highly differentiated. The firm can use a price skimming strategy to achieve their profit maximization objective (Nagle and Holden 1995, pp. 154–158). In a second scenario, the same company is faced with highly price sensitive customers. If the firm can reduce its unit costs by spreading its fixed costs over a high volume of output, the firm can use a penetration pricing strategy to achieve the profit maximization objective (Nagle and Holden 1995, pp. 159–160). The determinants in these examples were price sensitivity, product differentiation, and potential for economies of scale.

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Diamantopoulos (1991, 1994) refers to these determinants collectively as the "pricing environment," describing them as the elements that constitute the setting within which price decision-making takes place. One goal of this study is to understand what elements of the pricing environment affect the managers' usage of various pricing strategies.

Previous empirical studies that have investigated the use of pricing strategies have generally been limited in scope to researching small numbers of firms or to identifying strategies without regard to determinants (Abratt and Pitt 1985, Morris and Pitt 1993, Udell 1972). Studies that have looked at both strategies and their determinants across a large number of firms have generally not been statistically rigorous (see Diamantopoulos (1991) for review of these studies). Our study of current managerial pricing practice attempts to remedy these shortcomings.

A Framework for Industrial Pricing Strategy

After an extensive review of the literature, we identified a set of industrial pricing strategies and determinants following the example set by Tellis (1986). However, our study focuses on the under-researched area of industrial (capital goods) pricing while the Tellis framework is more oriented towards consumer products. To accommodate these differences, we have made some modifications to his original framework.

First, we excluded pricing strategies predominantly used with consumer products or commodities (i.e., defensive pricing, random discounts), strategies usually associated with export markets (i.e., second market discounting) or pricing tactics (e.g., basing point pricing). Second, we added cost-plus pricing and customer value pricing due to their prominence in previous studies of industrial pricing (Morris and Calantone 1990).

The ten pricing strategies are described in Table 1.

Note that a *related* strategy is either part of the strategy (e.g., markup pricing is a form of cost-plus pricing) or is similar to the strategy. Specifically, a related strategy is one which can be expected to occur under similar conditions and result in a similar price level (e.g., opportunistic pricing and low-price supplier).

Pricing Strategy Determinants

In every normative discussion of pricing strategy, a set of market, company, and competitive conditions is specified under which a given strategy should be used. Since these conditions *determine* when a given strategy should be used, we refer to them as determinants.

The set of determinants we included in our study includes major elements of Tellis' (1986) framework including product differentiation, economies of scale, capacity utilization, and switching costs. Other determinants are based on additional sources including pricing articles (Dean 1950), specialized pricing monographs (Oxenfeldt 1975, Nagle and Holden 1995) and general marketing management texts (Kotler 1997, Guiltinan et al. 1997).

During our literature review, we found that some determinants are common to more than one strategy. For example, if brand demand is elastic, then penetration pricing, experience curve pricing, parity pricing, low-price supplier pricing, complementary product pricing, and bundling are all acceptable options depending on the other market, company, and competitor conditions. Therefore, knowing that a firm faces high levels of brand elasticity does not help much in determining which pricing strategy it will use.

On the other hand, we found that some determinants can be used to define a particular pricing situation. For example, the presence of other products from the same firm (either substitutes or complements) is common to bundling, customer value pricing, and complementary product pricing. Furthermore, this determinant is unique to this group of strategies. Therefore, we identified these three strategies as a particular pricing situation which we call the product line pricing situation. By organizing the ten strategies into four separate pricing situations, we can model how often a manager chooses one of the appropriate strategies when he or she is in a given pricing situation. The determinants for the four pricing situations are discussed in detail next.

Pricing Situations and Their Determinants

To better illustrate the commonalities and differences among the determinants of various pricing strategies, we have organized the ten strategies into four pricing situations: new product, competitive, product line, and

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Table 1 Pricing Strategy Definitions

Strategy	Description	Related Strategies
New Product Pricing Situation		
Price Skimming	We set the initial price high and then systematically reduce it over time. Customers expect prices to eventually fall.	Premium Pricing, Value-in-Use Pricing
Penetration Pricing	We initially set the price low to accelerate product adoption.	
Experience Curve Pricing	We set the price low to build volume and reduce costs through accumulated experience.	Learning Curve Pricing
Competitive Pricing Situation		
Leader Pricing	We initiate a price change and expect the other firms to follow.	Umbrella Pricing, Cooperative Pricing, Signaling
Parity Pricing	We match the price set by the overall market or the price leader.	Neutral Pricing, Follower Pricing
Low-Price Supplier	We always strive to have the low price in the market.	Parallel Pricing, Adaptive Pricing, Opportunistic Pricing
Product Line Pricing Situation		
Complementary Product Pricing	We price the core product low when complementary items such as accessories, supplies, spare parts, services, etc. can be priced with a higher premium.	Razor-and-Blade Pricing
Price Bundling	We offer this product as part of a bundle of several products, usually at a total price that gives our customers an attractive savings over the sum of individual prices.	System Pricing
Customer Value Pricing	We price one version of our product at very competitive levels, offering fewer features than are available on other versions.	Economy Pricing
Cost-based Pricing Situation		
Cost-Plus Pricing	We establish the price of the product at a point that gives us a specified percentage profit margin over our costs.	Contribution Pricing, Rate-of-Return Pricing, Target Return Pricing, Contingency Pricing, Markup Pricing

cost-based. The basis of this organization is a set of determinants which are common to every strategy in a given situation and unique to that situation.

The first situation, new product, includes the three strategies most closely associated with new products: skim pricing, penetration pricing, and experience curve pricing. Every one of these strategies shares the distinction of being appropriate in the early life of a product. Therefore, we expect that the age of the model being priced will determine whether a manager chooses one of the new product pricing strategies.

In the competitive pricing situation, the main focus is the price of the product relative to the price of one or more competitors. A mature market and easy to estimate demand are common to the leader pricing, parity pricing, and low-price supplier strategies. We expect that the stage of the product life cycle and ease of estimating demand will influence whether a manager will choose one of these competitive pricing strategies.

For managers in the *product line* pricing situation, the price of the focal product is influenced by other related products or services from the same company. These related products may be complements, substitutes, or ancillary items such as spare parts; they may be products sold simultaneously or in another time period. Common to the strategies of complementary product pricing, price bundling, and customer value pricing is the existence of related products, accessories, or supplementary goods (e.g., spare parts) (Guiltinan et al. 1997). We expect that managers in firms which sell goods and services related to the focal product will choose one of the product line pricing strategies.

In the *cost-based* situation, the primary consideration

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is the internal costs of the firm including fixed and variable costs, contribution margins, and so on. The strategy included in this category is cost-plus pricing. Several related strategies, such as target-return pricing, are included as part of cost-based pricing strategies.

Diamantopoulos (1991) claims that cost-plus pricing is by far and away the most widely used pricing strategy. The Hall and Hitch (1939) survey of 39 business managers found the general pattern of price setting to be cost-based. The later Brookings Institution Studies (Kaplan et al. 1958) corroborated this finding. Thirty years later, Bonoma et al. (1988) found that managers continue to use cost as a primary pricing concern.

Most authors caution managers against relying on cost-based methods for establishing prices (e.g., Nagle and Holden 1995). The only competitive situation in which cost-plus pricing is profit-maximizing is one in which average unit costs are likely to be constant over time and at any point on the demand curve (Lillien and Kotler 1983, p. 405–407). However, due to economies of scale and/or experience curve effects, neither of these conditions are likely to hold in a manufacturing industry (Lillien and Kotler 1983, p. 407).

The weakness of cost-plus pricing is that it ignores consumer and competitive information. However, if a manager has little or no information about demand, we expect that he or she is more likely to choose cost-plus pricing (Harrison and Wilkes 1975).

There may be additional organizational factors which may lead to a firm using cost-based pricing. For example, risk aversion or the need to justify a given price internally might lead to a reliance on cost-based methods.

It is important to note that a manager may be in more than one pricing situation simultaneously. For example, in the classic Harvard Business School case, "Deere & Company: Industrial Equipment Operations" (Shapiro 1977), the price for a new model of bulldozer has to be determined, clearly a new product situation. At the same time, since the demand for bulldozers is mature and market leader Caterpillar offers comparable models, the pricing has to reflect competitive prices as well. Deere also sells spare parts that represent a significant income stream over the life of the product. Maximizing the revenue stream from the entire product line (accessories, spare parts, etc.) is another important consideration. Therefore, as in this well-known case study, there can be one, two, or more pricing situations (i.e., new product, competitive, product line, and/or cost-based) involved in a single pricing decision.

We organized the current literature with regard to the pricing situations, the pricing strategies, and their determinants in Table 2.

In the next section, we will discuss the determinants for each pricing strategy within its pricing situation.

Determinants of Pricing Strategies

In three of the pricing situations, new product, competitive, and product line, there is more than one possible pricing strategy. For each of these strategies, we have identified the determinants which are unique to that strategy and those which are common to other strategies within that strategy situation. The unique and common determinants for these strategies are discussed next.

New Product. There are three options for pricing new products: skimming, penetration, and experience curve pricing. Skimming is the practice of setting a high initial price which is often systematically discounted over time. The purpose of skim pricing is to discriminate between those buyers who are insensitive to the initial high price because of special needs. As this segment becomes saturated, the price is lowered to broaden the appeal of the product (Dean 1950).

The timing of subsequent entry is a key factor in the success of skim pricing. Since new competitors will drive down prices, skim pricing takes advantage of a temporary monopoly position. The additional margins obtained through skim pricing have to be balanced against lower current unit sales and leave a larger demand potential available to subsequent entrants.

Skim pricing is recommended over penetration or experience curve pricing when there is a high degree of product differentiation in the market (Jain 1993). Without this condition, there cannot be a "better" product which would command a higher price. In addition, there must be some buyers who are price insensitive, i.e., willing to pay more for a product that meets their special needs (Guiltinan et al. 1997; Schoell

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Table 2 Determinants of Pricing Strategies

New Product Pricing Situation		Skim Pricing	Penetration Pricing	Experience Curve Pricing
Determinant of pricing situation:	Product age	New (1,10)	New (1,0)	New (10,11)
Determinants of pricing strategies:	Product differentiation	**High** (4,8,10)	Low (4,8,10)	Low (4,8,10)
	Significance of product change	**Major** (6,10)	Minor (6,10)	Minor (6,8,10)
	Costs	**High** (4,10)	Low (4)	Low (4)
	Scale or experience curve effects	**Disadvantage** (10)	**Advantage: scale** (3,4,8,10,11)	**Advantage: experience** (4,8,10,11)
	Demand	**Inelastic** (4,8,10)	Elastic (1,3,4,6,8)	Elastic (1,3,4,6,8,9)
	Factory capacity utilization	**High** (3,10)	Low (10,11)	Low (10,11)

Competitive Pricing Situation		Price Leadership	Parity Pricing	Low-Price Supplier
Determinant of pricing situation:	Product Life Cycle	Mature (5)	Mature (3,5)	Mature (5)
	Ease of determining demand	Easy (4)	Easy (4)	Easy (4)
Determinants of pricing strategies:	Market share	**High** (4,5)	Low (8)	Low (2,5)
	Costs	Low (4)	**High** (2,3,4)	Low (8)
	Scale or experience curve effects	Advantage (2,4)	**Disadvantage** (3)	Advantage (4)
	Ease of detecting price changes	Easy (2)	Easy (3,8)	**Difficult** (2)
	Total demand	Inelastic (2,3)	Inelastic (3)	**Elastic** (3)
	Factor capacity utilization	High (10)	High (10)	**Low** (5)
	Product differentiation		Low (8)	Low (8)
	Brand Demand		Elastic (3)	Elastic (3)

Product Line Pricing Situation		Complementary Product Pricing	Bundling Pricing	Customer Value Pricing
Determinants of pricing situations	Firm sells supplementary and/or complementary products (other models, ancillary products, spare parts)	Yes (3)	Yes (3)	Yes (3)
Determinants of pricing strategies:	Profitability of accompanying or supplementary sales	**High** (3,5)		
	Switching costs	**High** (11)		
	Per sale/contract pricing		**Yes** (4)	
	Market appeal			**Narrow**
	Market growth rate			**Low**
	Ease of detecting price changes			**Difficult**
	Brand demand		Elastic (3)	Elastic (3,7,8,10)
Cost-Based Pricing Situation		Cost-Plus Pricing		
Determinants of pricing situation:	Ease of determining demand	Difficult (3)		

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1. Dean (1950)
2. Greer (1984)
3. Guiltinan, Paul and Madden (1997)
4. Jain (1993)
5. Kotler (1997)
6. Mercer (1992)
7. Monroe (1990)
8. Nagle and Holden (1995)
9. Oxenfeldt (1975)
10. Schoell and Guiltinan (1995)
11. Tellis (1986)

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and Guiltinan 1995). The new product usually represents a major improvement over previous versions in order to command a premium price (Mercer 1992). Finally, firms with high factory utilization (Schoell and Guiltinan 1995) or those who lack cost advantages due to scale or learning should consider skimming over the low-price new product pricing strategies (Schoell and Guiltinan 1995).

Both penetration and experience curve pricing involve setting a low initial price for a new product. Penetration pricing is used to speed adoption of a new product or establish it as a de facto standard. It is suggested that firms with cost advantages due to scale use penetration pricing (e.g., Tellis 1986).

Experience curve pricing has a different focus and source of advantage than penetration pricing. The experience (or learning) curve effect shows that unit costs fall with cumulative volume due to increased familiarity with the assembly process and other factors (Boston Consulting Group 1972). However, there is a great deal of controversy about the extent of these effects (e.g., Amit 1986).

Experience curve pricing seeks to exploit the experience/learning curve by setting prices low to build cumulative volume quickly and, thereby, drive down unit costs. The presence of these experience/learning curve effects are necessary for this pricing strategy to be a success (Tellis 1986, Jain 1993; Nagle and Holden 1995). Whether this is a sound long-term strategy has been questioned on many fronts (e.g., Abernathy and Wayne 1974, Alberts 1989, Ghemawat 1985, Kiechel 1981).

The common conditions that favor the low-price new product strategies contrast those for skim pricing: low product differentiation (Schoell and Guiltinan 1995), used for minor product revisions (Mercer 1992), elastic demand (Guiltinan et al. 1997), and low capacity utilization (Schoell and Guiltinan 1995).

Competitive Pricing. Price leaders initiate price changes and expect that others in the industry will follow suit. Price leaders tend to have higher prices than their competitors who use the leader's price to set their own price levels (Greer 1984, Jain 1993). Hence, this strategy is also known as Umbrella pricing. Price leaders such as Caterpillar in heavy equipment tend to have the highest market share as well (Kotler 1997).

Parity pricing involves imitating the prevailing prices in the market or maintaining a constant relative price between competitors. In some respects, this strategy is born of weakness. If a firm had a superior product, it should be able to command a premium price (Guiltinan et al. 1997). Or, if the firm had cost advantages, it could become a low-price supplier (Jain 1993). If a firm has high costs, its only option in a mature market is to employ parity pricing (Jain 1993, Guiltinan et al. 1997).

Three conditions are common to both leader pricing and parity pricing: markets in which price changes are easy to detect (Nagle and Holden 1995), inelastic total demand (Guiltinan et al. 1997), and high factory utilization (Schoell and Guiltinan 1995).

Low-price suppliers could be exploiting a cost advantage (Nagle and Holden 1995) or reflecting a weakness (i.e., low factory utilization; see Kotler 1997). In addition, a low-price supplier might be exploiting a lack of pricing knowledge in the market by undercutting its rivals (Greer 1984). If this undercutting behavior were known, it might ignite a damaging price war. Finally, the low-price supplier strategy should be more successful in markets with high levels of overall elasticity (Guiltinan et al. 1997).

Common to both the low-price supplier strategy and price leadership is low costs (Greer 1984, Nagle and Holden 1995) due to scale or experience curve effects (Jain 1993). Low market share is a common determinant for parity pricing and low-price supplier pricing (Nagle and Holden 1995, Kotler 1997). As mentioned above, both parity pricing and low-price supplier pricing are suggested for markets where brand elasticity is high (Guiltinan et al. 1997). In addition, these two strategies are expected to be more successful in markets with low levels of product differentiation (Nagle and Holden 1995).

Product Line Pricing. The economic and psychological aspects of price bundling have been explored in depth elsewhere (Thaler 1985, Guiltinan 1987). Most of the suggested determinants for bundling pricing are common to other pricing strategies. Therefore, such determinants cannot be used to predict which firms will use bundling versus other strategies that share these determinants.

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The sole exception is the type of price-setting process. When each sale or contract is priced separately, as in the case of system selling of mainframe computers, then bundling is a preferred option (Jain 1993). For example, a major avionics firm uses bundling in most of its pricing. Its customers need systems for control, communications, and navigation. To avoid a competitive pricing battle for each system, this firm quotes a bundled price for the entire package. Since this firm is one of the few that makes all of these products, it usually wins the contract. Other firms could submit a bid for the entire bundle by using subcontracting. However, the firm that makes all of these components in-house has important supply synergies that it can exploit through a lower price. In addition, bundling reduces the number of suppliers and potential incompatibility problems for the airframe manufacturer. This is a clear demand-side advantage for the full-line avionics firm.

Complementary product pricing is well illustrated by Gillette's strategy of selling razors cheaply and blades dearly. In many industrial markets, a firm will offer a wide range of supplies, spare parts, and accessories which make up a large portion of the profit stream from the customer. In the Deere case above, it was suggested that a bulldozer consumes 90% of its initial purchase price in spare parts over its lifetime.

Under this strategy, the main product or platform is sold for a relatively low price while the ancillary or supplementary products carry a high margin (Guiltinan et al. 1997). For example, the markup on spare parts for bulldozers can be as high as 200%, much higher than the margin on the main product (Kotler 1997, p. 515). Tellis (1986) suggests that high customer switching costs may keep customers buying the captive, high-margin additional products.

Customer value pricing is becoming increasingly common in industrial markets. This strategy involves pricing one version of the product at very competitive levels, offering fewer features than are available for other versions. The most visible applications of this strategy have been in consumer markets. For example, when McDonald's lowered the price of its basic hamburger to 59 cents in 1990, its was employing customer value pricing to spur sales in a low growth market (Gibson 1990, Rigdon 1990).

Manufacturers of consumer durables such as Pella Windows have introduced new lines of products with fewer features and lower pricing points than their traditional customized lines (Nagle and Holden 1995, p. 165). Usually, these products are intended for a specific market segment. In the case of Hon furniture, it produced a new line of less expensive office furniture for home offices to be distributed through category killers (narrowly focused retailers) such as Staples rather than their full-service dealer network.

In industrial markets, Forbis and Mehta (1981) argue that the appeal of value-priced products varies by the intensity of product usage and geographical scope of usage. For example, low intensity users of cranes (such as junk yards) are more sensitive to the initial price than heavy users (such as contractors). When operating in a developing country, the reliability of an earth moving machine and the availability of spare parts becomes more important than the initial acquisition price. Other important factors might include the growth rate of the customer's business and the particular application of the product within the customer's business.

In contrast to the case with consumer markets, customer value pricing in industrial markets is more likely to be successful if price changes are *difficult* to detect. Since the firm is providing most of the functionality of its main product for a lower price, it runs a large risk of cannibalizing its main, higher priced product (Dolan and Simon 1996, pp. 212–214).

Both bundling and customer value pricing should be more successful in markets with high levels of brand elasticity (Guiltinan et al. 1997, Nagle and Holden 1995).

Summary

In Table 2, we organize and summarize the previous normative research on pricing in a new and, we feel, enlightening way. This framework can be used by managers to understand how academic research prescribes different pricing strategies under various market, product, and information conditions. Furthermore, this framework can be used to guide future empirical and theoretical work on pricing strategies since it shows where current research is underdeveloped. For example, little is understood about

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how organizational factors affect or should affect pricing strategy. In the next section, we use the determinants for the pricing situations and pricing strategies presented above to model the pricing decisions of practicing managers.

A Study of Managerial Pricing Practice

We conducted an extensive survey of industrial pricing managers to determine how well current practice matches the normative pricing theory discussed above. This survey provides important benchmarking information for managers seeking to understand how other firms choose their pricing strategies.

Survey

The survey document was a four page questionnaire mailed to practicing managers in May and June of 1994. The survey underwent extensive pretesting to assure readability and accurate understanding of the questions. This included pilot testing with written and verbal feedback from a convenience sample of executive MBA students as well as a review of the survey by two noted academic pricing scholars from other institutions. Copies of the survey are available from the authors.

To avoid the criticisms leveled at many studies of pricing objectives by Diamantopoulos (1991, p. 136), we asked the managers to provide information on their most recent pricing decision of a single industrial capital good rather than indicating an overall pricing strategy for all products or circumstances.

Measures of Pricing Strategies. Previous research on pricing objectives shows that many managers use more than one objective in their pricing decisions (e.g., Diamantopoulos 1991). To reflect the similar complexity of the pricing strategy decision, we allowed respondents to indicate their usage of up to three pricing strategies. The response to this question was ratio-scaled (importance weights summing to 100%) in order to assess the magnitude of the importance of a given strategy in the decision.

Note that we did not label any of the pricing strategies with respect to their corresponding pricing situation. The proposed pricing situations—new product pricing, competitive pricing, product line pricing, and cost-based pricing—did not appear on the survey. We wanted to avoid priming the subject to choose the appropriate strategy for the stated situation. Therefore, our tests of the first level of the framework in Table 2 should be less biased.

In the pretesting for this study, we found that none of the managers used more than three alternatives. In our final results, we found that 48.5% used one strategy, 28.5% two, and 22.5% used three strategies. We note that the average importance of the third strategy was 15% (versus 28% for the second strategy). Therefore, if there is any bias in not allowing for more than three strategies, it is not expected to be very large.

In addition, we allowed the manager to specify a pricing strategy that was not part of the list of ten strategies provided. Of the 21 who did, a total of 17, upon review by two independent judges and the authors, were found to be special cases or related strategies of the original ten strategies. The remaining observations were dropped from the analysis.

Measures of Determinants. We modeled the scales to measure the determinants after the questions used in the PIMS database (Buzzell and Gale 1986). We pretested the wording and meaning of the scales in a pretest with experienced managers. The determinants and their measurement scales are presented in Table 3.

Sample

We focused our survey on the pricing decisions of differentiated, durable capital goods in business-to-business markets. We restricted our sample to these industries since industrial components, supplies, or raw materials are less likely to be highly differentiated, which would restrict the pricing strategy options of the firms. Furthermore, since channels of distribution in industrial markets tend to be shorter than those in consumer markets, the manufacturer exerts more control over pricing to end-users.

Fifteen such industries were identified using 4-digit SIC codes. The target industries and distribution of firm sizes are presented in Table 4.

Contact names and addresses for the 1,534 firms were purchased from Dun and Bradstreet. Initially,

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Table 3 Determinants of Pricing Strategies

Definition of Determinant	Scale in Survey
Market Conditions	
Sensitivity of customers to price differences between brands	1 = insensitive, 7 = sensitive
Sensitivity of total demand to changes in average price	1 = insensitive, 7 = sensitive
Ease of determining market demand	1 = easy, 7 = difficult
Market growth	1 = low, 7 = high
Switching costs	1 = low, 7 = high
Competitive Conditions	
Ease of detecting competitive price changes	1 = difficult, 7 = easy
Concentration: Three firm concentration ratio	1 = <5%, 7 = >80%
Product differentiation	1 = low, 7 = high
Product/Company Conditions	
Age of product in years	1 = not yet available, 2 = <1 year, 6 = 10+ years
Cost (dis)advantage due to experience curve	1 = (dis)advantage, 0 = otherwise
Cost (dis)advantage due to economies of scale	1 = (dis)advantage, 0 = otherwise
Capacity utilization (relative)	1 = low, 7 = high
Costs (relative to competitors)	1 = advantage, 7 = disadvantage
Major Product Change: Significance of most current design change	1 = totally new product, 0 = otherwise
Market Coverage	1 = all segments, 7 = one segment
Market Share	1 = low, 7 = leader
Per sale/Contract Pricing	1 = yes, 0 = no
Profitability of accompanying sales (e.g., other products)	1 = low, 7 = high
Profitability of supplementary sales (e.g., spare parts, service)	1 = low, 7 = high

surveys were to be addressed only to job titles including Director of Marketing, Sales Manager, Pricing Manager, and variations of these titles. However, this targeting approach resulted in the exclusion of too many smaller companies. Therefore, the category of President, CEO, and variations of these titles was included as well since this was the only title available for the majority of the smaller companies.

A total of 1,021 firms was selected from this list (after deleting replicated records from the total of 1,034). In a pretest using a similar survey,[1] a sample of 200 mailings was sent out. The sample was stratified based on firm size. This pretest showed that response rate increased monotonically with firm size.

To best represent the pricing behavior in these industries, we drew a disproportionate stratified sample for the final study. There were five size categories of firms. The number of firms remaining after the pretest in the largest four categories was relatively small. A survey was sent to every one of these firms. The remaining names were randomly selected from those available in the smallest category.

This approach is consistent with syndicated surveys such as the Neilsen Retail Index. Our intent is to understand marketing behavior in as large a proportion of the market as possible. Therefore, this sampling approach should capture the widest variation in pricing behavior in these industries since there are more strategic options for larger firms than smaller ones.

Each firm was sent a survey package including a personalized, hand-signed cover letter with a pledge of confidentiality of individual responses, a four-page survey, and a $1 incentive. The pretest also showed that the response rate for a $2 incentive (32%) was identical to that for a $1 incentive (31%).

A total of 347 surveys were returned to the authors. Of these, 77 were returned blank (62), incomplete, or

[1]The Noble (1997) study of pricing objectives is identical except for the measures of pricing strategies.

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Table 4 Mailing List by SIC Code and Revenue

4-Digit SIC Code	Industry	Number of Firms
3523	Farm	138
3531	Construction	142
3532	Mining	63
3537	Industrial Trucks and Tractors	93
3541	Machine Tools, Cutting	57
3542	Machine Tools, Forming	77
3549	Metal Working Machines	32
3554	Paper Industry Machines	83
3571	Electronic Computers	269
3663	Radio and TV Communication Equipment	188
3711	Tractor and Tractor Trucks	18
3721	Aircraft	41
3743	Railroad Equipment	64
3812	Search and Navigation Equipment	118
3823	Process Control Instruments	151
	Total	**1534**

Company Size (Annual Revenue in Millions)	Number of Firms	Number of Firms in Final Mailing	Number of Firms Responding
$5–$14	836	427	93
$15–$49	393	342	77
$50–$149	149	130	36
$150–$499	75	65	24
$500+	81	70	39
unknown			1
Total	**1534**	**1034**	**270**

were otherwise[2] unusable (15). This yielded a gross response rate of 34% (347/1,007 delivered). The total usable sample was 270 for a usable response rate of 27% which is a similar sample size[3] and usable response rate[4] to recent surveys of marketing managers. Overall, these 270 respondents made 470 choices among the ten alternative pricing strategies.

Respondent Profile. The responding managers are highly experienced with pricing as the majority are involved in such decisions for more than 20 products. The majority of respondents also report 10+ years of experience in the industry and with their current company. In addition, these managers were highly involved in the pricing decision they describe. On a seven-point scale (7 = high, 1 = low), the average self-reported involvement was 5.98.

Median firm size was between $15 and $50 million

[2]For example, the respondent indicated multiple price levels which may indicate the response was for a product line rather than a single product.

[3]During the five years preceding this study (1989–1994), twenty-two surveys of managers were published in the *Journal of Marketing Research* (JMR). The average sample for all of the surveys was 284. During the same period, the *Journal of Marketing* (JM) published 41 articles involving surveys of managers. The average sample for all of the surveys was 270.

[4]In the period 1989–1994, response rates were often unreported for studies in JMR and JM. Managerial survey studies in the JM articles had average gross response rates of about 32% and usable response rates of 29%. In the JMR articles, the response rates were higher, with the gross response rate of about 40% and the usable response rate of 37%.

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in annual sales. These firms compete in highly concentrated markets with an average 3-firm concentration ratio of about 70%.

Strategy Measure Cross-Validation One of the limitations of previous studies of pricing objectives is the lack of an objective measure to cross-validate the pricing objective indicated by the respondent. For example, a firm whose objective is to maximize profits may have a relatively low price or a relatively high price depending on its strategy (penetration versus skim pricing). Therefore, the price charged by the firm cannot be used to cross-validate the self-reported measure of pricing objective.

For most pricing strategies, however, there is some relationship between the relative price level in the marketplace and the pricing strategy. Strategies leading to relatively high prices include leader pricing and skim pricing. Relatively low prices should be expected from those firms employing the penetration pricing, experience curve pricing, complementary product pricing, customer value pricing, or low-price supplier strategies. Market-equivalent prices should result from parity pricing.

For bundling pricing, we do not have a prior expectation since the product is priced as part of a bundle. Similarly, the relationship between the relative price level and cost-plus pricing will be based on relative costs which are known and profitability levels which are not.

We asked the respondents to indicate the relative price of their product in addition to their pricing strategies. The scale ranged from 1 = 5% or less than the market to 5 = 5% or more than the market.

We compared the average response from managers indicating that they used a given strategy with the average response for the entire sample. We used a 1-tail t-test with the overall average as the population mean for all but the comparison for parity pricing. Since the null hypothesis is that there is no difference between the price level for firms using this strategy and the overall relative price for all firms, we used a 2-tailed t-test. The results are in Table 5.

The two groups with an expected high relative price are indeed higher than the average for all respondents (skim pricing, leader pricing). Parity pricing had an average price level no different from the overall mean, as we expected (2-tailed test). Finally, three of the five pricing strategies with expected relatively low prices had average price levels that were significantly lower than the overall average. Based on these results, we conclude that the self-reported measures of pricing strategies are robust.

Survey Analysis

Model Specification

We collected information from managers on the pricing strategies they used as well as the prevailing pricing environment. These data have a special structure that make them different from the usual discrete choice data. Therefore, we had to make some important modeling decisions, which are discussed next.

First, our pricing framework contains two levels: the pricing situation and the pricing strategies within each situation. It would appear that a nested logit model would be appropriate. However, note that the independent variables differ across *individuals*, not their choices as in the case of typical multiple-stage consumer choice model. With data varying across individuals and not choices, the nested logit model is not identified.

At the same time, respondents can use more than one strategy within a given situation. Almost ten percent (25/270) of the respondents did, in fact, exercise this option. Typically, such observations are dropped or one choice is indicated using a tie-breaking mechanism. Therefore, even if we could identify a multinomial choice model for the second stage of the decision, we may be ignoring crucial information by dropping these observations.

Given the data, we chose to model this as a "pick k from n" situation. To begin, we constructed three observations for each respondent, one each for the three strategies within the pricing situation. For the new product situation, for example, if the respondent assigned a positive weight to skim pricing, the dependent variable for the first observation was 1 and 0 otherwise. The dependent variables for the second and third observations depended on whether or not the respondent assigned a positive weight to the corresponding pricing strategies.

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Table 5 Cross-Validation of Pricing Strategy Using Relative Price

Strategy	Number of Respondents Choosing this Strategy	Expected Relative Price	Mean of Relative Price	Std. Dev. of Relative Price	t-statistic (p-value)*
Skim Pricing	37	High	4.11	1.51	2.22 (0.02)
Leader Pricing	31	High	3.97	1.40	1.63 (0.06)
Parity Pricing	82	Same	3.35	1.20	1.59 (0.12)**
Customer Value Pricing	29	Low	3.37	1.42	−0.72 (0.24)
Experience Curve Pricing	32	Low	3.68	1.49	−0.46 (0.33)
Complementary Product Pricing	24	Low	3.21	1.25	−1.37 (0.09)
Penetration Pricing	25	Low	2.68	1.77	−2.49 (0.01)
Low-Priced Supplier	24	Low	2.00	1.25	−6.46 (0.00)
Entire Sample***		3.56			

Note: *p*-value calculated for 1-tail t-test except for ** which is the *p*-value for the 2-tailed t-test. *** This is based on the responses for 270 firms. Note that each respondent may have chosen more than one strategy.

Since the signs of the determinants varied across the strategies, the independent variables for the determinants were all estimated as interaction terms. For example, we constructed three cost variables, one for each observation. The first cost variable corresponded to the cost level indicated by the respondent in the first observation only. It was set to zero otherwise. The second cost variable was zero for the first and third observations and set to the cost level given by the respondent for the second observation and so on. Similarly, we defined the interaction terms for the other variables.

The determinants of the pricing situation are common to all of the strategies. Each of these variables was present in each observation.

We estimated the importance of the determinants of the pricing situation and individual pricing strategies simultaneously by estimating a single logit model for all of the observations ($3 \times 270 = 810$). This "stacked" binary logit formulation is similar to the approach used in SURE for cross-equation constraints.

While this approach does allow us to use all of our responses while retaining the "pick k from n" nature of our data, we do have to use a binary response variable rather than importance weights assigned by the respondents. One alternative would have been to estimate separate tobit models (Tobin 1958) for each individual strategy. In a tobit model, the response variable is either zero or a positive value and most observations are zero. Such a formulation fits our data well.

However, McDonald and Moffitt (1980) show that for low incidence choices, most of the information in the tobit model explains whether or not the dependent variable is positive rather than saying anything about differences in magnitude. In our sample, the contribution of the determinants to explaining whether or not a given strategy was chosen in a tobit model ranges from 75% (parity pricing) to 89% (low-price supplier and complementary product pricing) (Roncek 1992). Therefore, we feel the loss of information by using choices rather than magnitudes is minimal compared to the advantages gained through the "stacked" binary logit procedure discussed above. A logit model is estimated separately for each of the four pricing situations.

In the following sections, we discuss the estimation results organized by the pricing situation.

The New Product Pricing Situation

The determinant for the new product situation was the time of introduction of the current model of the product being priced. The possible answers range from 1 (not yet available) to 6 (10 years or more). We expect this variable to be negatively associated with the probability of choosing any of the new product strategies. The estimation results are presented in Table 6.

New product strategies were chosen 93 times by 32% (87) of the respondents. The logit model was significant

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Table 6 New Product Pricing Situation: Logit Model Estimation

	Determinants (Expected Sign)	Estimate (Prob > Chi²)
New Product Pricing Situation		
Skim Pricing	Product Age (−)	−0.26 (0.00)
	Product Differentiation (+)	0.31 (0.01)
	Major Product Change (+)	−0.33 (0.43)
	Costs (+)	0.08 (0.61)
	Cost disadvantage: Scale (+)	0.71 (0.08)
	Cost disadvantage: Learning (+)	−1.10 (0.17)
	Market Elasticity (−)	−0.00 (0.96)
	Brand Elasticity (−)	−0.14 (0.23)
	Capacity Utilization (+)	0.05 (0.62)
Penetration Pricing	Product Differentiation (−)	0.12 (0.38)
	Major Product Change (−)	−0.28 (0.58)
	Costs (−)	−0.20 (0.28)
	Cost advantage: Scale (+)	1.14 (0.01)
	Market Elasticity (+)	0.48 (0.00)
	Brand Elasticity (+)	−0.43 (0.00)
	Capacity Utilization (+)	0.07 (0.59)
Experience Curve Pricing	Product Differentiation (−)	0.21 (0.08)
	Major Product Change (−)	−1.05 (0.04)
	Costs (−)	−0.00 (0.99)
	Cost advantage: Learning (+)	0.12 (0.76)
	Market Elasticity (+)	0.06 (0.62)
	Brand Elasticity (+)	0.16 (0.19)
	Capacity Utilization (+)	−0.20 (0.09)
Model Intercept		−2.25 (0.00)

at the $p < 0.01$ level. The choice of any of the three new product pricing strategies was negatively and significantly ($p < 0.00$) related to the age of the product being priced.

Skim Pricing. We found that about 14% of respondents (37/270) chose skim pricing. The median positive importance weight for skim pricing was 70%. More than 40% of respondents choosing this strategy gave it an importance weight of 100%.

Skim pricing was chosen in markets with high levels of product differentiation ($p < 0.00$) by firms with a cost disadvantage due to scale ($p < 0.08$).

Penetration Pricing. Nine percent of respondents (25/270) indicated that they used this strategy. The median positive importance weight for penetration pricing was 40%.

Penetration pricing is used more often by firms with cost advantages due to scale ($p < 0.05$) and those facing a high level of market elasticity ($p < 0.01$) as well as a low level of brand elasticity ($p < 0.01$). These latter two results may indicate that Penetration pricing is being used in the early stages in the product life cycle when there are few direct competitors and competition comes primarily from substitutes.

Experience Curve Pricing. Eleven percent of respondents (31/270) used experience curve pricing. The median positive importance weight for experience curve pricing was 60%. Fully 30% of respondents choosing this strategy gave it an importance weight of 100%.

Experience curve pricing is chosen more often in markets with high levels of product differentiation ($p < 0.08$), for products which are not major revisions ($p < 0.04$), and firms with low capacity utilization ($p < 0.05$).

While the latter two results are consistent with previous research, the use of this strategy in markets with high levels of product differentiation is not. One possible explanation is that firms using this strategy are market followers who are cutting prices now to build volume and drive down costs in anticipation of the future commoditization of the market. This is one mode of competition in the computer chip industry when clone chip producers introduce their products at much lower prices to shift the focus of competition from performance only to a price-performance condition. At that point, the clone manufacturers try to build an advantage over the innovating firm by lowering their costs via large volumes. Unfortunately, firms using this approach might also be "leaving money on the table" by cutting prices to build volume if the expected price-dominant phase of competition does not materialize.

The Competitive Pricing Situation

For the competitive pricing situation, the first determinant is the stage of the product life cycle. This variable ranged from 1 for products in their introductory stage to 4 for products in decline. We expect the product life cycle to be positively related to the probability of choosing any one of the three competitive pricing strategies or leader, parity, or low-price supplier. In

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addition, we expect that at least one of the competitive pricing strategies will be chosen when demand is easy to determine (Jain 1993). The estimation results for this pricing situation are presented in Table 7.

The competitive pricing strategies were chosen 137 times by a total of 127 (47%) of the respondents. The overall model was significant at the $p < 0.01$ level. The managers' choices of the three competitive pricing strategies were positively and significantly ($p < 0.01$) related to the stage of product life cycle. The relationship with the ease of estimating demand was not different from zero.

Leader Pricing. Eleven percent of respondents (31/270) used leader pricing. Leader pricing has a median positive importance weight of 50%. None of the determinants of leader pricing was significant at the 0.10 level.

This is unfortunate since it would be interesting to see if size still mattered in being a leader or whether cost position or even the level of innovation had become more important.

Parity Pricing. Parity pricing was used by 30% (82/270) of respondents. The median positive importance weight for parity pricing was 50%. However, more than 25% of those choosing parity pricing gave it an importance weight of 100%.

We see that parity pricing is more likely to be used by firms with high costs ($p < 0.00$), that have low market shares ($p < 0.01$), and high levels of capacity utilization ($p < 0.07$). Parity pricing is more likely to be used in markets with low levels of product differentiation ($p < 0.02$). Contrary to expectations, parity pricing is used in markets with high levels of overall elasticity ($p < 0.07$) and brand elasticity ($p < 0.00$).

This is an interesting result since it suggests that some determinants might be binding while others are not. The characteristics of the firm (high cost, low market share, and high utilization) do not allow it to exploit an otherwise favorable external condition (high demand elasticity). An interesting direction for future pricing research would be to identify those conditions which constrain the choices faced by the firm and those which are merely favorable to a given strategy.

Table 7 Competitive Pricing Situation: Logit Model Estimation

	Determinants (Expected Sign)	Estimate (Prob > Chi²)
Competitive Pricing Situation	Product Life Cycle (+)	0.40 (0.00)
	Ease of Estimating Demand (−)	−0.01 (0.91)
Leader Pricing	Market Share (+)	0.04 (0.70)
	Costs (+)	0.11 (0.46)
	Cost advantage: Scale (+)	0.61 (0.15)
	Cost advantage: Learning (+)	0.56 (0.19)
	Ease of Detecting Price Changes (+)	0.07 (0.50)
	Market Elasticity (−)	−0.10 (0.36)
	Capacity Utilization (+)	−0.04 (0.76)
Parity Pricing	Market Share (−)	−0.22 (0.01)
	Costs (+)	0.48 (0.00)
	Cost disadvantage: Scale (+)	0.08 (0.82)
	Cost disadvantage: Learning (+)	0.41 (0.38)
	Ease of Detecting Price Changes (+)	−0.32 (0.71)
	Market Elasticity (−)	0.17 (0.07)
	Capacity Utilization (+)	0.05 (0.57)
	Product Differentiation (−)	−0.23 (0.03)
	Brand Elasticity (+)	0.34 (0.00)
Low-Price Supplier	Market Share (−)	−0.04 (0.75)
	Costs (−)	−0.65 (0.00)
	Cost advantage: Scale (+)	0.96 (0.07)
	Cost advantage: Learning (+)	−0.36 (0.49)
	Ease of Detecting Price Changes (−)	0.18 (0.15)
	Market Elasticity (+)	0.01 (0.95)
	Capacity Utilization (−)	−0.25 (0.08)
	Product Differentiation (−)	0.117 (0.23)
	Brand Elasticity (+)	0.28 (0.07)
Model Intercept		−3.86 (0.00)

Low-Price Supplier.
About 9% (24/270) of respondents followed the low-price supplier strategy. The median positive importance weight for the low-price supplier strategy was 70%. Almost 30% of those choosing this strategy gave it an importance weight of 100%.

The low-price supplier strategy was chosen more often to firms with low capacity utilization ($p < 0.08$), firms with low costs overall ($p < 0.00$), and firms with cost advantages due to scale ($p < 0.07$). The low-price supplier strategy is also used more often in markets with a high level of brand elasticity ($p < 0.07$). In such a market, a firm with low overall costs has the ability to price low, and low factory capacity utilization provides the incentive.

The Product Line Pricing Situation
To determine if the firm sells other supplementary or complementary products to the model being priced,

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we asked the managers if the firm produced either substitute or complementary products. We used their answers to construct a single dummy variable with a value of one if the firm also produced such products, and zero otherwise. We expect that this variable will be positively related to the probability of choosing one of the product line pricing strategies. The estimation results for this pricing situation are presented in Table 8.

Product line strategies were used least often (88 times by 76, or 28%, of the respondents). The logit model was significant at the $p < 0.01$ level. As expected, these strategies were used when the firm also offered other substitutable products or complementary products ($p < 0.06$).

Price Bundling. Thirteen percent of respondents (35/270) chose bundling. The median positive importance weight was 20%.

Bundling is more likely to be chosen when firms are pricing each sale or contract individually ($p < 0.01$) and in markets where brand elasticity is high ($p < 0.02$). As in the earlier avionics example, the product composition of many industrial purchases is unique from one order to the next. Bundling allows the supplier to address the unique needs of the customer and remain highly competitive in a price-sensitive market.

Complementary Product Pricing. About 9% (24/270) of respondents incorporated complementary product pricing into their overall strategy. The median positive importance weight for this strategy was 20%.

Of its determinants, it is the high profitability of accompanying sales which influences the probability of this strategy being chosen ($p < 0.02$). Note also that the relative price for this strategy is low (Table 5). This is very consistent with what we predict with razor-and-blade type products and durables which require the eventual purchase of captive spare parts in large quantities.

Customer Value Pricing. Customer value pricing was used by 11% (29/270) of respondents. The median positive importance weight for customer value pricing was 30%.

The results for this strategy suggest that customer value pricing is used more often for products which would appeal to a narrow segment ($p < 0.10$). It is also used more often in markets where price changes are difficult to detect ($p < 0.02$). The results imply that these firms may be using the customer value strategy to secretly cut prices for a specific segment without taking the risks associated with straight price reductions which might spark a costly price war.

Table 8 Logit Model Estimations

	Determinants (Expected Sign)	Estimate (Prob > Chi²)
	Product Line Pricing Situation	
Product Line Pricing	Sell substitute and/or complementary products (+)	0.77 (0.06)
Bundling Pricing	Per Sale/Contract Pricing (+)	1.01 (0.01)
	Brand Elasticity (+)	0.24 (0.02)
Complementary Product Pricing	Profitability of accompanying sales (+)	−0.13 (0.39)
	Profitability of supplementary sales (+)	0.34 (0.02)
	Switching Costs (+)	0.00 (0.97)
Customer Value Pricing	Ease of detecting price changes (−)	−0.26 (0.02)
	Market Coverage (+)	0.24 (0.02)
	Market Growth (−)	0.19 (0.10)
	Brand Elasticity (+)	0.16 (0.18)
Model Intercept		−3.86 (0.00)
	Cost-Based Pricing Situation	
Cost-Plus Pricing	Ease of Estimating Demand (+)	0.13 (0.09)
Model Intercept		−0.20 (0.50)

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Contrary to expectations, customer value pricing is used in high-growth rather than low-growth markets ($p < 0.10$). This may indicate that customer value pricing is being used in new, higher-growth channels as in the cases of Pella and Hon mentioned above rather than as a spur to boost sales in a stagnant market.

The Cost-Based Pricing Situation

The sole determinant for the cost-based pricing situation is the ease of determining demand in the market. We expect that this variable will be positively related to probability of choosing the cost-plus strategy. The results are also presented in Table 8.

The overall model was significant at the $p < 0.09$ level. The choice of cost-based pricing was positively and significantly related to the difficulty in estimating demand ($p < 0.10$). Firms in markets where demand is very difficult to estimate are almost 40% more likely to choose cost-based pricing than those in markets where demand is easy to estimate (66.5% v. 48.3%).

Cost-Plus Pricing. Consistent with previous research, cost-plus pricing was the prevalent pricing strategy. A majority of respondents (152/270 = 56%) reported using a cost-based pricing strategy in their decision. The median positive importance for cost-plus pricing was 60%. More than a third of respondents choosing this strategy gave it an importance weight of 100%.

Summary of Results

The results from the study of managerial pricing practice are summarized in Table 9.

The results above provide insight into what pricing strategies managers use under different situations. In some cases, the unique determinants for each strategy can help better predict which strategy will be used in a given situation. For example, in the competitive pricing situation, firms with relatively high costs are more likely to choose parity pricing while those with low capacity utilization are more likely to choose low-price supplier pricing. For new products, penetration pricing is more likely to be used when a firm has cost advantages due to scale while skim pricing is more likely to be used when the firm is at a cost disadvantage due to scale, and product differentiation is high. As expected, bundling pricing was more likely to be used when each sale is priced separately and complementary product pricing is used more often when profits from supplementary sales are high. Finally, customer value pricing is more important when price changes are hard to detect and the product appeals to a narrow market segment.

In addition to these results, we also have identified conditions under which various strategies are used in pricing industrial products. Since these conditions are not unique to a given strategy, they should be viewed with some caution if used to predict which strategy a firm might use. The same conditions might be appropriate for another strategy but this relationship was not confirmed by our data.

Limitations and Directions for Future Research

While the results reported above are very exciting, they are not complete due to the sample in our verification study. We are limited in the types of products (industrial capital goods), customers (domestic U.S.), and companies (offering products for sale in domestic U.S. markets) studied. For example, there is little variation in the sample in concentration and height of entry barriers. Concentration affects the degree of pricing discrimination possible in the market while the height of entry barriers affects whether or not a firm considers potential as well as current rivals in its pricing strategy. Clearly, these factors may have a strong influence on pricing strategy and should be examined in future research.

In addition, there was very little variation in self-evaluated product quality. The average rating was 5.79 out of 7 (std. dev. = 1.08). This is not surprising given a manager's bias towards his/her own firm's products. However, keep in mind that these are very highly concentrated markets from which firms with marginal quality might have already been eliminated.

The empirical study of pricing managers provides some important insights into current pricing practices. One of the more interesting results is the varied importance of different pricing strategies. Some strategies tend to have higher importance weights when chosen while others seem to have consistently low importance weights.

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Table 9 Summary of Study of Managerial Pricing Practice

Pricing Situation	Determinants	Pricing Strategies Related Strategies	Significant Determinants	Relative Price
• New Product Pricing	• New model	Skimming (Premium pricing, Value-in-use pricing)	• High product differentiation in the market • Cost disadvantage due to scale	• High
		Penetration Pricing	• Cost advantage due to scale • Elastic market demand • Inelastic brand demand	• Low
		Experience/Learning Curve Pricing	• High product differentiation in the market • Not a major product change • Low capacity utilization	
• Competitive Pricing	• Mature market	Leader Pricing (Umbrella pricing, Cooperative pricing, Signaling)		• High
		Parity Pricing (Neutral pricing, Follower pricing)	• High costs • Low market share • Low product differentiation • Elastic market and brand demand • High capacity utilization	• Equal
		Low-price Supplier (Parallel pricing, Adaptive pricing, Opportunistic pricing)	• Low factor utilization • Low costs • Cost advantages due to scale • No cost advantage due to learning • Elastic brand demand	• Low
• Product Line Pricing	• Firm sells substitute or complementary products	Bundling (System pricing)	• Per sale/contract pricing • Elastic brand demand	
		Complementary Product Pricing (Razor-and-blade pricing)	• High profit on supplementary sales	• Low
		Customer Value Pricing (Economy pricing)	• Hard to detect price changes • Narrow market appeal • High market growth	
• Cost-Based Pricing	• Difficult to determine demand	Cost-Plus Pricing (Contribution pricing, Target return pricing, Markup pricing)		

*Based on t-tests in Table 5.

The skim, experience curve, and low-priced supplier strategies all tend to be important if they are part of the manager's pricing decision as is cost-plus pricing. Parity pricing is an interesting split. While its median is the same as leader pricing (50%), almost half of the observed distribution lies outside of middle of the scale (30%–80%).

In contrast, the pricing strategies in the product line situation are seldom very important as measured by their importance weights. This may indicate that other

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pricing situations, i.e., introducing a new product, being in a mature market, or having little information about demand, are more important than product line considerations.

The pricing framework presented above can be used to determine which pricing strategies are used in pricing a complex, high-value industrial product. However, it does not suggest how these strategies are or should be *combined* to determine the ultimate pricing schedule. At this stage it is only possible to comment on the relative importance of the strategies. For example, it is not known if the strategies are usually chosen simultaneously or sequentially. Future research should explore how these strategies are integrated by managers into a final decision.

Another interesting result was the prevalence of cost-plus pricing. A full 56% of the 270 managers mentioned cost-plus pricing. When it was used, it was the dominant strategy (with an importance weight larger than any of the others mentioned) 71% of the time. This confirms the observations of Simon (1989) and others that, even after all of the research on market- and competitive-oriented pricing, cost-based methods remain prevalent.

Cost-plus pricing is an inward oriented strategy, involving company and product considerations, while the other nine pricing strategies generally have an outward orientation, focusing on the customer and competition (Day and Nedungadi 1994). Over 35% of the managers responding used a combination of cost-plus pricing and one of the other nine market based strategies, implying that a significant number of managers are looking inward and looking outward to set their prices. This suggests that many managers have a Janus-faced approach to choosing a pricing strategy. Their gaze is fixed both inside and outside their companies at the same time (Monroe 1990). Whether this approach leads to better market (sales, share, customer retention) or financial results would be another fruitful avenue of research.

In their 1988 article, Bonoma et al. stated that managers find little of the pricing research in marketing to be of any practical help. We hope this study answers the call of many to bridge the gap between the normative research and actual managerial pricing practice.[5]

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