



# Managing the influence of internal and external determinants on international industrial pricing strategies

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## Abstract

In developing pricing strategies, managers typically take into account a wide array of factors, including those that are internal to the firm as well as those that are external to its operations. However, little attention has been paid to how managers consider these factors in combination and how such judgments affect their ultimate choice of pricing strategy. These questions are the focus of this study, particularly as they pertain to international pricing decisions. Drawing on key dimensions thought to influence the relative weights that pricing managers place on both internal and external factors, the study details how those relative weightings influence the ultimate strategies managers employ. Findings indicate that international experience, product technology, degree of internationalization, market share, and certain external factors influence weightings managers give to internal and external factors in the process of making international pricing decisions. Furthermore, these decision-making factors combine to affect the specific strategies pricing managers employ in determining international prices.

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## 1. Introduction

Because pricing decisions have a direct effect on revenue, they have always occupied a crucial place in strategic planning. Regardless of product or industry, a well-established price enables the firm to best capture the value embodied in a product and thereby establish a competitively advantageous position in the market. Pricing decisions, however, can be difficult, and often speculative, due to the uncertainties associated with today's dynamic environments (Kortge, Okonkwo, Burley, & Kortge 1994). Rapid changes in information systems, proliferation of product lines, and advances in technology are but a few of the elements

marketers are confronted with in developing pricing strategies.

This level of difficulty is compounded further when managers attempt to develop pricing strategies in the international arena. By attempting to operate in multiple markets, international firms are confronted with an even more complex and dynamic set of environmental contingencies (Phatak, 1998; Sundaram & Black, 1992), all of which serve to magnify the problem of decision uncertainty for managers. However, little is known about how managers attempt to cope with such complexity in the formulation of pricing strategy. This gap in knowledge is not inconsequential. Failure to understand how environmental forces affect pricing decisions exposes decision-makers and their organizations to unnecessary levels risk. Research that sheds light on these factors and their effect on pricing strategy not only expands the body of knowledge about pricing decisions, but it also offers a more informed decision-making context to pricing managers.

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As with any strategic decision, pricing strategy can be influenced by two types of factors, internal and external factors. One internal factor that exerts considerable influence on pricing decisions is that of corporate cost (production and/or marketing). Cost (Monroe, 1990) is frequently used by decision-makers as a basis of pursuing objectives such as profit maximization or target return (Forman, 1998). Some corporate objectives, however, may have strategic rationales that do not necessarily involve specific return rates, making the use of internal cost factors less viable as a basis for implementing pricing strategies (Ghoshal & Moran, 1996; Phatak, 1998). Thus, internal factors other than cost may play a significant role in an organization's pricing strategy formulation—e.g., capacity utilization (Noble, 1995; Noble & Gruca, 1999) or market contribution rates (Forman, 1998).

That external market factors influence the determination of pricing strategies is well established in the economic literature (Diamantopoulos, 1994; Sawyer, 1981). Market-related dimensions such as consumers' sensitivity to price (Montgomery & Rossi, 1999) and their switching costs (Coe, 1990) as well as industry barriers to entry (Davies, 1991) and elements of distribution (Chhabra, 1996) all have an impact on the pricing strategy managers ultimately adopt. As such, those strategies will differ considerably from those based on internal factors such as cost (Monroe, 1990). The question addressed here is whether and to what degree each factor type (internal, external, or both) influences the selection of pricing strategy (Shapiro & Jackson, 1978). In doing so, we attempt to assess the

determinants that guide managers' emphasis on those factor types, particularly the determinants that arise in the domain of international pricing.

Research on international pricing strategy is relatively limited (Javalgi, Cutler, Rao, & White, 1997). Although price is the only marketing mix factor that does not require a substantial investment (Rao 1984; Samiee, 1987), and it underpins a firm's revenues (Diamantopoulos & Mathews, 1995; Monroe & Della Bitta, 1978), production, distribution (Fitzpatrick, 1964), and profitability (Marshall, 1979), little has been done to explore its role in the international arena.

In attempting to address this issue, the research presented here is designed with two objectives in mind. First, the study empirically investigates the antecedents associated with internal and external decision-making factors that presumably underpin pricing decisions. Second, we attempt to examine the importance of those decision-making factors on the specific pricing strategies enacted by pricing managers.

Fig. 1 depicts antecedents to international pricing strategies where international experience, product technology, degree of internationalization, and market share as decision-making determinants are hypothesized to affect the relative weight that managers place on various internal and external factors in determining pricing strategy. We tested this framework in the context of industrial pricing and found moderate support, which implicates both internal and external decision-making factors as significant inputs to managers' pricing decisions.

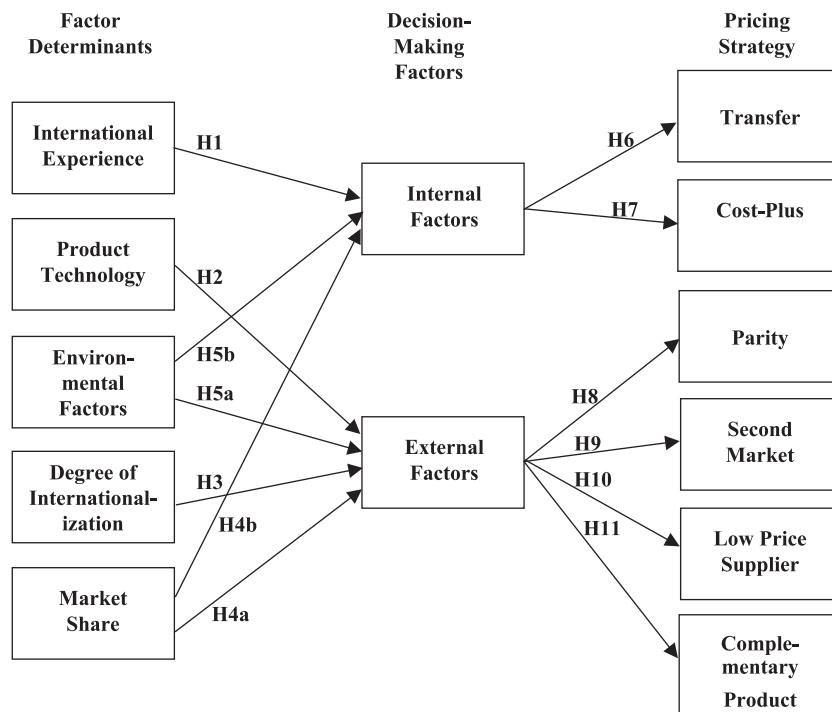


Fig. 1. Research model.

## 2. Internal decision-making factors

### 2.1. Factory capacity utilization

As noted by Noble (1995), firms have control over factory capacity in the long run, but relatively little control in the short run. If so, factory utilization should have a positive impact on cost-based pricing strategies in the short run. For instance, organizations operating at full capacity are able to spread fixed costs over more units, thereby achieving greater flexibility in developing pricing strategies. This route to pricing flexibility is equally available to U.S. MNCs, even when their international pricing decisions are decentralized. In the latter case, foreign divisions can utilize excess capacity to increase production and lower prices in their respective markets (Cavusgil, 1996). In sum, the internal focus of factory capacity utilization rates should have a direct effect on pricing strategies employed in the international marketing arena.

### 2.2. Internal cost structure

Some firms have more advantageous cost structures than others. The fact that most firms use cost plus pricing strategies suggests that cost advantages are translated into advantages in price levels (Govindarajan & Anthony, 1983; Monroe, 1990). The Heckscher–Ohlin Model suggests cost advantages are related to abundant factor endowments (e.g., labor) in one country relative to another (Husted & Melvin, 1993). For example, firms with production facilities in countries with a relative abundance of labor will have cost advantages over firms in countries with no excess labor. More globally integrated economies suggest that factors of endowment (and thus, internal cost structures) may play a more important role in managing MNCs, including their pricing strategies.

Most recently, technological changes have become a prominent force in shaping cost structures. Frequently, these changes have had a long-term effect on entire industries (Husted & Melvin, 1993). Technological change can also effect short term cost advantages. For instance, firms often exploit technological advantages gained from adopting innovation in production processes. As a result, they experience cost advantages, which in turn, impact pricing strategies.

### 2.3. Market contribution rate

The market contribution rate is defined as the percentage of total firm profits represented by one particular product (Forman, 1998). Product contributions to organizations' profitability often varies from one product line to another (Morris, Burns, & Avila, 1989). A product accounting for a significant profit contribution to a firm will garner more attention than a less lucrative product, thus affecting the pricing strategy selected (Forman & Lancioni, 2002). Thus,

the relative profitability associated with a product will affect pricing strategies.

## 3. External decision-making factors

### 3.1. Price sensitivity of customers

To effectively implement pricing strategy, marketers must understand price elasticity of their product over different levels of output (Monroe, 1990). Along with the number of substitute products, the price elasticity of a firm's product affects consumers' price sensitivity. To avoid establishing nonoptimal pricing strategies, managers must be cognizant of their customers' price sensitivity and what the competitors are charging for substitutable products. In the extreme, mistaking elastic demands for inelastic markets may lead to pricing decisions that produce revenue below optimality. According, pricing managers must scan the environment to ensure they are establishing prices that are competitively advantageous.

### 3.2. Switching costs

Customer switching costs can vary between products, and this difference can affect the flexibility that managers have to set prices—firms can capitalize on these differences by employing appropriate pricing strategies (Stango, 2002). Customers that currently own products with high switching costs, in effect, are captive to the products. As a result, they are less sensitive and more impervious to competitive pricing efforts (Nagle & Holden, 1995). Thus, firms trying to enter markets where the switching costs are high may have a difficult time (Han, Kim, & Kim, 2001). Nevertheless, pricing strategies can be useful in facilitating entry. One example comes from the entertainment industry, where technology has frequently lowered switching costs. When the DVD player was introduced as a replacement for the VCR, consumer switching costs were relatively high. These costs, however, dropped, in part, as a result technological advances, which lowered the price of DVDs and DVD players. As a consequence, pricing flexibility regarding DVDs was increased, allowing managers to pursue optimal pricing strategies. More generally, the level of switching costs will dictate the amount of flexibility associated with selecting pricing strategies.

### 3.3. Barriers to entry

Barriers to entry play a significant role in developing pricing strategies (Naumann & Lincoln, 1991) and include nontariff trade barriers, patents, or technological advantages. Firms in industries where these barriers to entry are high, tend to be in a better position to retain relatively high prices and profits without fear of competition. Industrial organization theory suggests that incumbents in industries

requiring larger sunk costs and greater the economies of scale, can use price, as a barrier to entry (Scheffman & Spiller, 1992). These barriers to entry are exogenous factors that affect strategic pricing.

#### 4. Factor determinants

##### 4.1. International experience

A manager's international decision-making experience is an important factor in his/her development of international strategies. For example, international experience has been found to affect global posture (Carpenter & Fredrickson, 2001), investment strategies in emerging economies (Delios & Henisz, 2000) and product and promotion strategy adaptation (Cavusgil & Zou, 1993). It seems reasonable to expect, therefore, that international experience should also be an important influence on the development of pricing strategies.

In general, the decision-making process is thought to involve an integration of rational with tacit knowledge. Rational knowledge is the reliance on objective facts and data, whereas tacit knowledge is practical knowledge acquired through (and that increases with) experience, and not through direct instruction. Tacit knowledge cannot be overtly stated or expressed (Wagner & Sternberg, 1985). Eventually, "experience becomes integrated, actions become second nature, and collected impressions guide actions that are often below the consciousness of individuals and groups" (Giunipero, Dawley, & Anthony, 1999). Over time, managers keep track of their experiences, which might include data relating to previous decisions, situations, processes, outcomes, and the associated heuristics used (Sauter, 1999). That the acquisition and accumulation of tacit knowledge can help managers make faster and more effective decisions is explicable in terms of image theory (Agor, 1985; Eisenhardt, 1990). According to this, when a decision situation is encountered, and is recognized as having been successfully dealt with in the past, the modus operandi employed in the earlier situation is immediately activated and implemented in the new encounter (Mitchell & Beach, 1990). This suggests that, as decision-makers realize the consequences of their decisions and behaviors, they rely implicitly on their memory of those decisions and outcomes when making future decisions (Gagne, 1965). Given that internal factors such as capacity, cost structures, and contribution rates likely comprise key roles in decision makers' experience, they should take on greater accessibility in decision makers' memory. As such, decision makers' utilization of these factors in formulating pricing strategy should increase as experience in international pricing increases. This relationship forms the basis of our first hypothesis regarding the effects of various determinants on the extent to which managers utilize internal or external factors in making

pricing decisions. Thus, in an international pricing situation:

**H1:** The degree to which managers' rely on internal organizational factors in implementing pricing decisions will be positively related to the amount of experience those decision makers have with international pricing.

##### 4.2. Technological dimensions of products

With the current infusion of high-technology products, global competition has intensified, product markets have become more turbulent, and product life cycles are becoming shorter (Bahrami & Evans, 1995; Lee, 2002). Product life cycles take on particular significance because marketing decision-makers are faced with strategy changes over different stages of the life cycle. In this sense, the life cycle, with its various stages, is a determinant of marketing strategies (Anderson & Zeithaml, 1984). Similarly, as technological breakthroughs continue, product obsolescence rates accelerate. This increase in velocity forces pricing managers to become more cognizant of, and responsive to, market trends such as changing customer needs and competitor offerings when making strategic pricing decisions (Fisher, 1997; Karakaya & Kobu, 1994). In essence, rapid technological changes necessitate the adoption of a market orientation (Hunt & Morgan, 1995) and its attendant attention to external factors.

The strategic implications of technology are straightforward. Both consumer and competitive analyses will have a greater impact on the formulation of strategy than they will in more static market situations. In addition, as Abratt (1986) suggests, this impact will be particularly noticeable in the case of pricing decisions which must take into consideration consumers' willingness to tradeoff price for technological product benefits.

**H2:** The degree to which managers rely on external factors in implementing pricing decisions will be positively related to the degree of technology inherent in the product.

##### 4.3. Degree of internationalization

As with every decision, uncertainty makes the development of pricing strategy a risky undertaking. According to Miller (1992), uncertainty here refers to "the unpredictability of environmental or organizational variables that impact corporate performance," while risk is the "unpredictability in corporate outcomes" (Miller, 1992). This being so, a firm can reduce uncertainty and, thus risk, by accounting for and/or controlling either its internal or environmental factors (Cyert & March, 1963).

One way a global company can take action to reduce risk is to integrate its efforts internationally. For instance, a greater degree of internationalization allows subsidiaries

across various countries to flexibly shift resources from one country to another in response to new information and /or changes in relative prices (Ghoshal, 1987; Rangan, 1998). This kind of response to external forces allows managers to adjust price to a less-volatile revenue stream. Furthermore, the more experience managers have in dealing with risk across foreign markets, the more confident they will be in handling pricing problems in that environment (Erramilli, 1991). But, however construed, such a decision necessitates a heightened managerial attention to external conditions (along with experience) existing in relevant international marketing environments.

**H3:** The degree to which managers rely on external factors in implementing pricing decisions will be positively related to the level of internationalization employed by the firm.

#### 4.4. Market share

Market share plays a significant role in strategic marketing and managerial efforts within organizations. Porter (1980) suggests market share will influence the strategic intent of an organization by affecting buyers' and suppliers' power, the number and strength of potential entrants, and the level of competition within an industry. From a strategic pricing perspective, larger firms must necessarily focus on external factors if they are to minimize the effects of competition. The implementation of strategies such as limit pricing is an example of managerial intent to maintain barriers to entry (Nagle & Holden, 1995). At the same time, maintaining large volume sales to continue to take advantage of economies of scale are also critically important to these firms. Cost controls and factory capacity utilization require careful scrutiny (Noble & Gruca, 1999). Two contrasting hypotheses follow.

**H4a:** The degree to which managers rely on external factors to implement pricing decisions will be positively related to the existing market share held by their firm.

**H4b:** The degree to which managers rely on external factors to implement pricing decisions will be positively related to the existing market share held by their firm.

### 5. Environmental determinants

Several external environmental factors are thought to impact the use of both internal and external factors in developing pricing decisions. According to the framework offered here, environmental factors are exogenous in that they operate outside of pricing managers' control. In that sense, the most important of these are (1) the effects of exchange rate fluctuations, (2) tariffs and inflation rates, and (3) the extent of foreign intervention (Forman, 1998).

#### 5.1. Exchange rates

Successful firms may experience losses due to volatile exchange rates (Terpstra & Sarathy, 1997). As Cavusgil (1988) notes, MNCs need to develop strategies to effectively counter exchange rate fluctuations. Current strategies tend to focus on market price stabilization (Tange, 1997). Exchange rate volatility can also affect global subsidiary profitability, impacting internal shifts of profit centers. Therefore, the effect of fluctuating exchange rates should have an effect on the pricing strategies of firms, whether those strategies rely on either internal or external (or both) factors for pricing.

#### 5.2. Tariffs

Tariffs are used by countries for two basic reasons, first, as sources of revenue for the importing countries' governments and second, to protect domestic industries (Cateora, 1996). The effects of tariffs artificially create market inefficiencies. These inefficiencies result in welfare losses borne by the customers of protected products in the form of higher prices. Since tariffs directly add to the costs and therefore the price of products, it is likely that they will have an impact on the effects of internal and external pricing factors on pricing decisions (Husted & Melvin, 1993).

#### 5.3. Inflation

Inflation, especially hyperinflation, plays a key role in international pricing; an extreme example of this would be the inflation rate in Bolivia during the 1980's. Inflation was so high then (especially in 1985) that, at 11,750%, prices were changing hourly (Husted & Melvin, 1993). A consequence of significant inflation is a devaluation of the local currency relative to foreign currency (Montgomery, 1988).

The most immediate effect of inflation on pricing is the cost of providing product to customers (Dolan, 1981) as costs may rise faster than prices (Terpstra & Sarathy, 1997). Therefore, the cost of providing products in inflationary economies will be higher and more unpredictable than in other more stable economies. Trying to predict inflationary trends in different economies is difficult at best, even with advanced forecasting procedures, accentuating the risks associated with inflationary economies. This is especially true for industrial products, which are typically sold under long-term contracts (Dolan, 1981). Accordingly, industrial firms frequently develop pricing strategies that hedge against such inflationary trends.

#### 5.4. Government intervention

Actual or threat of government intervention represents a significant international business risk (Makhija, 1993). Government intervention refers to the real or potential

impediments that originate in the host governments. This includes nonmonetary intervention such as price controls, antitrust legislation, or other financial reporting requirements as non-tariff trade barriers. Consistent with an open systems approach the implications for this determinant suggest MNCs need to continually scan governmental activities to account for changes which may impact strategic pricing decisions.

Combined, the above four determinants constitute environmental factors affecting strategic initiatives of MNCs, including pricing strategies. Consequently, the relationship between environmental determinants and managers' use of various decision-making factors is offered in two contrasting hypotheses:

**H5a:** The degree to which managers rely on external factors to implement pricing strategy will be positively related to the degree to which they judge that one or more macro-environmental factors (exchange rates, tariffs, inflation, and governmental intervention) are operative components of the pricing situation.

**H5b:** The degree to which managers rely on internal factors to implement pricing strategy will be positively related to the degree to which they judge that one or more macro-environmental factors (exchange rates, tariffs, inflation, and governmental intervention) are operative components of the pricing situation.

## 6. Pricing strategies

### 6.1. Transfer pricing strategy

Transfer pricing is a strategy used when MNCs "sell" products to their divisions in other countries. Transfer prices between divisions will vary depending on variables such as the taxation rates (i.e., higher income tax rates in the parent's home country will lead to lower transfer prices emanating from the home country to foreign divisions) and the desire to minimize profitability of subsidiaries as a barrier to entry (Rahman & Scapens, 1986). Market prices are charged when tax rates are less favorable in the receiving divisions. The internal cost orientation and intraorganizational profit orientation suggests the following relationship:

**H6:** Managers' use of transfer pricing strategies will be positively related to their reliance on internal decision-making factors in setting prices.

### 6.2. Cost-plus pricing strategy

This is the most widely used pricing strategy (Diamantopoulos, 1991; Morris & Morris, 1990; Rogers, 1990). Cost-plus pricing plays an important role in export

pricing of industrial products, especially when firms begin to export to guard against market related uncertainty. Thus, when entering countries for the first time, it is easiest to develop a price based on the most accurate available information, internal cost figures (Noble, 1995). Morris and Morris (1990) and Guiltinan (1976) cite that one of the chief reasons for the use of cost based pricing is a risk avoidance mentality of pricing managers. This implies cost-based methods will be used when the cost of gathering demand related information exceeds the profits realized from pricing profits yielded by this approach (Montgomery, 1988). Thus, cost-plus strategies are more concerned with the supply side than demand (Leighton, 1966; Rogers, 1990). The internal orientation of using internal costs as a basis for a cost-plus pricing strategy suggests the following relationship:

**H7:** Managers' use of cost-plus pricing strategies will be positively related to their reliance on internal decision-making factors in setting prices.

### 6.3. Parity pricing strategy

A firm adopts this strategy when it sets its prices in a range where most buyers would find the prices acceptable and appropriate (Morris & Morris, 1990). Parity pricing is used by firms with lower industry control and market share (Rogers, 1990). Firms adopting this strategy do so in lieu of charging a higher price for fear that competition could gain a significant advantage due to volume sales and experience cost savings (Nagle, 1987). The external orientation associated with using a parity pricing strategy suggests the following relationship:

**H8:** Managers' use of parity pricing strategies will be positively related to their reliance on external decision-making factors in setting prices.

### 6.4. Second market pricing strategy

Second market pricing is a strategy where different prices are charged based on distinct international markets. This strategy is viable when the price differential between markets does not exceed the transaction costs associated with arbitraging a product from one market to the next (Tellis, 1989). Accordingly, this strategy must be employed with caution. If price differences between markets are too great, parallel markets may develop, thus reducing overall profitability (Gabor, 1998). Second market pricing is a particularly important international pricing strategy in the industrial products sector. In fact, the use of this strategy is pervasive in the industrial sector as most of the dumping (an extreme form of second market pricing) complaints filed with the International Trade Commission are for goods such as chemicals and machine parts (Bernhofen, 1995). The external orientation associated with using a

second market pricing strategy suggests the following relationship:

**H9:** Managers' use of second market pricing strategies will be positively related to their reliance on external decision-making factors in setting prices.

### 6.5. Low price supplier strategy

Firms using this strategy tend to adopt one of Porter's (1980) three generic strategies, low cost provider. Three conditions must be in place in order for this pricing strategy to be effective. The first is that the low cost suppliers need to be in a market in which their price changes are not easily detected by competitors (Nagle & Holden, 1995; Rogers, 1990). Second, these suppliers be in a market position in which competitors cannot effectively retaliate against them (Nagle, 1987). For example, the ability of a competitor to retaliate would be limited if it is already producing at full capacity and cannot increase output. The third condition favorable to a low price strategy is that competitors' willingness to retaliate should be low, or unthreatened. If larger competitors were to retaliate in the case of a restricted market, the price reduction might undermine overall sales and profits in the larger related markets. In some cases this type of retaliation may be restricted by governmental regulations that prevent larger firms from engaging in price retaliation (Nagle, 1987). The external orientation associated with using a low price supplier pricing strategy suggests that an external managerial orientation facilitates the use of a low price strategy.

**H10:** Managers' use of low price supplier pricing strategies will be a positively related to their reliance on external decision-making factors in setting prices.

### 6.6. Complementary product pricing

This pricing strategy is usually more appropriate with products with high switching costs (Tellis, 1986). The motivation of firms to use this strategy is to enhance customers' involvement with the original product to the degree that they are likely to purchase increased amounts of ancillary products or supplies. In effect, this scenario renders customers "captive" to the original product. As a result, higher profits are frequently realized by the supplier. Thus, the advantage-accorded firms using complementary products is that by charging a lower price for the primary product, they realize the benefits of higher profits through the sale of the complementary products or supplies. Firms that compete on price with their primary products are pressured to recoup their costs on these products, while no such pressure exists for producers of complementary products (Kotler, 1997). The external orientation associated with using complementary pricing strategies suggests a

direct relationship between it and the use of complementary pricing.

**H11:** Managers' use of complementary pricing strategies will be positively related to reliance on external decision-making factors in setting prices.

## 7. Methodology

The present study investigates the relationship of both internal decision factors (factory capacity utilization, contribution rate, and cost structure) and external decision factors (price sensitivity of the customers, customer switching costs, barriers of entry) to managers' use of key pricing strategies. Decision-making factors were measured on a scale of 1–7 Likert-like scale (Appendix A). Respondents were asked to consider one particular international pricing decision they had made for a specific product within the last 12 months. To ascertain which pricing strategy the respondent had used in that situation, respondents were asked to read a description of each possible strategy at the outset of the procedure. Each description described the strategy so that the respondents could easily identify the strategy they had employed, although they might have referred to it by a different name (Appendix B).

Five variables are used as predictors of internal or external decision factors. Consistent with Cavusgil and Zou (1993), three measures of international experience (the number of years the decision-maker was in the industry, the number of countries in which the MNC is selling the product, and the number of years the MNC has been selling internationally) were obtained through participant self-reporting (Appendix A). For the level of product technology, respondents were asked to indicate the frequency with which changes in product characteristics occur, where more frequent changes signal a more innovative product. The degree of internationalization measure is consistent with (Lee, Roehl, & Choe, 2000; Reeb, Kwok, & Baek, 1998) as the ratio of international sales to total sales. To obtain a measure of the firm's market share, respondents were asked to indicate the extent of their market share for the relevant products on a 1–7 anchors (Appendix A).

### 7.1. Product selection

To minimize extraneous variables associated with the study, the product type and resulting type of buyer selected is critical. This study's focus is on industrial products because industrial buyers tend to have a relatively objective, or functional, set of motivations associated with their purchasing decisions (Noble, 1995). Alternatively, industrial transactions are influenced less by sociocultural needs and more by the goal structure of the firm.

The S.I.C. 35 was selected as the product class (e.g., engine turbines, pumps, and pump equipment) in an effort to ensure that the products are strictly industrial by nature. Products such as computers were not considered because they may be purchased for either industrial buyers or personal use. A total of 1044 surveys were mailed to U.S. firms selling industrial products internationally. Surveys were addressed to key informants, usually marketing managers or vice presidents. Companies and individuals were identified through the *Million-Dollar Directory* on disk.

### 7.2. Statistical procedures

Given the multiple dependent variables of the model decision-making factors, a GLM analysis was performed to identify the factors that have a significant effect on marketing managers' strategic pricing decisions and the level of importance of each (1 H2 H3 H4a H4b H5a H5b). Both variables were constructed by averaging the responses to the factors listed in the above section and included in the same regression statement. In addition, the study examined the impact the decision-making factors have on the probability of using a specific pricing strategy is selected. As a result, a logistic regression was selected for this study since this statistical method measures the probability that a specific event (i.e., the selection of a specific pricing strategy) will take place (Hair, Anderson, Tatham, & Black, 1992). In particular, a binary logistic regression analysis was used in which each strategy (dependent measure) was regressed on each decision-making factor (internal and external).

### 7.3. Validity of measures

While the measures of experience and degree of internationalization are based on prior studies, the other two independent variables (level of product technology and market share) are not. In an effort to establish the validity of

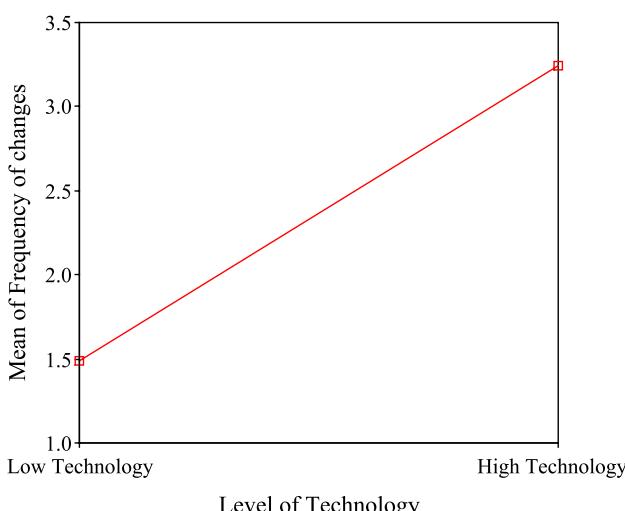


Fig. 2. Frequency of attribute changes with level of technology.

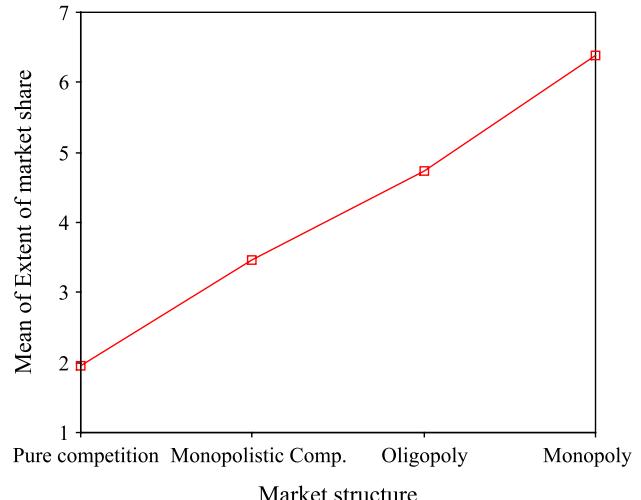


Fig. 3. Market share with market structure.

these latter two variables, a separate measure was used for each. In addition, a second measure was used to assess the validity of the level of product technology. This was a self-report of the level of technology associated with the product. The results of the self-report confirmed the validity of using the frequency of product changes to measure the level of technology (Fig. 2). Changes in product attributes were coded 1–4, from less frequently, every 2 years and beyond, to the most frequently, less than 1 year (Appendix A). The means of the frequency of changes associated with low- and high-technology products were 1.48 and 3.25 ( $p<.001$ ), respectively, confirming the validity of the technology measure.

To verify the validity of the measure of market share, respondents were also asked to identify the market structure in which their firm operated (Appendix A). As predicted, the market share means were lower for situations described as pure competition and higher for those described as monopoly ( $p<.001$ ), confirming the validity of the self-report of the market share (Fig. 3).

Table 1  
Factor analysis results

Component	1	2	3
ENV1	<b>0.638</b>		
ENV2	<b>0.752</b>		
ENV3	<b>0.868</b>		
ENV4	<b>0.849</b>		
EXT1		<b>0.602</b>	
EXT2		<b>0.390</b>	
EXT3		<b>0.433</b>	
INT1			<b>0.507</b>
INT2			<b>0.733</b>
INT3			<b>0.401</b>
Eigenvalue	3.077	1.348	1.162
Variance (%)	30.8	13.5	11.6

ENV=Environmental Factors. EXT=External Factors. INT=Internal Factors.

Table 2  
Correlation matrix of model variables

	Product technology	Experience	Internationalization	Internal factors	External factors	Environmental factors	Market share
Product technology	1.000						
Experience	.149	1.000					
Internationalization	−.080	−.028	1.000				
Internal factors	−.062	−.115*	−.032	1.000			
External factors	−.101*	−.032	−.010	.012	1.000		
Environmental factors	.037	.060	−.314**	.228**	.421**	1.000	
Market share	.027	.018	.069	−.105*	−.185**	−.070	1.000

\*  $p < .05$ .

\*\*  $p < .01$ .

A factor analysis was used to validate the environmental factors selected by the panel of judges. The items comprising the internal and external factors were also factor analyzed. Respondents were asked to indicate the importance of each item in the pricing decision-making context on a Likert type scale (with 1=unimportant and 7=important). Each item loaded significantly on the predicted three major factors above +.400 level (Table 1) with a varimax rotation. This is deemed acceptable (Hair et al., 1992).

The potential for nonresponse bias could be assessed by comparing the means of the responses in the last quartile (as they are assumed to be the most similar to the non-respondents) to those responses in the first three (Armstrong & Overton, 1977). Using this design, the *t*-test comparisons of the means of all the variables used in the study revealed no significant differences. In addition, surveys were sent out randomly to firms within the specified S.I.C. to further reduce the possibility of bias in the survey results.

In order to account for possible multicollinearity, a correlation analysis was conducted. This analysis yielded no significant correlations between the independent variables (Table 2) suggesting that multicollinearity is not likely to be a problem.

Another concern is whether or not the respondents indicated the "right" pricing strategy (i.e., they understood the definitions of the pricing strategies and applied their understanding correctly). To do this, the respondents' relative prices of those pricing strategies adopted by the firms were compared with the relative prices of the remaining pricing strategies. The respondents indicated the relative prices of their products by reporting the degree to which the prices were above, below, or about the same as the competitors' prices. All of the expected relationships are verified; for example, respondents who indicated they used low price supplier generally charged a statistically significant lower price than their competition (c.f. Forman, 1998 for a detailed discussion of this).

## 8. Results

Of the 1044 surveys sent out, 38 were returned due to bad addresses, yielding a net total of 1006 received by

industrial firms. Of that total, 190 responses were returned. Included in these responses were five from firms that did not or could not participate in the survey. This left 185 completed surveys returned. Fifty of these responses were deficient in that they were not completely filled out and/or left significant data unanswered, or did not follow the instructions. Thus, there were 135 net useable responses, yielding a response rate of 13.4%.

Respondents were asked to indicate their level of responsibility (as a percentage) relative to others' in the pricing decision process. The overall mean for pricing responsibility was 57% suggesting that these participants were in a position to provide reliable data pertaining to pricing decisions. Respondents were asked to indicate which pricing strategies they used. Fourteen pricing strategies were identified in the survey. The most important of these pricing strategies (representing 74.7% of the strategies used) are transfer, cost-plus, parity, second market, low price supplier, and complementary product pricing strategies and are included in this study.

In general, results of the multiple regression analysis indicate support the proposed hypotheses (Table 3). The first overall model pertaining to the effect of decision-making determinants on decision-making factors was found to be significant ( $p < .001$ ). Of particular interest is the overall finding that each of the pricing strategies was significantly and positively affected by either the internal decision-making factors or external factors, but not a significant combination of both. At least partial support is found for all hypothesized relationships between the decision-making factors and the pricing strategies (Table 3). Results of the specific hypotheses follow.

The first hypothesis states decision-makers will rely more on internal than external factors when developing strategies. The results of the regression procedure found support for this hypothesis. Internal factors were significant at ( $p < .01$ ;  $B = .136$ ;  $t = 2.949$ ), while no significant relationship was found for external factors (Table 3). While this hypothesis is supported, it is interesting to note that there has been a lack of support for the positive relationship between experience and the use of tacit knowledge in earlier studies (Brockmann & Simmonds, 1997; Giunipero

Table 3

GLM results of the hypothesized relationship between determinants and internal/external factors and logistic regression results between internal/external factors and pricing strategies

Dependent variable	Parameter	B	Std. Error	T
<b>External Factors</b>	<b>Intercept</b>	2.495	.349	7.156
	International	.073	.047	1.547
	Experience			
<b>H2**</b>	Product Technology	.136	.063	2.146
	Internationalization	.061	.034	1.789
	Market Share	.137	.039	3.486
<b>H4a***</b>	Environmental	.062	.010	6.058
	Factors			
	<b>Intercept</b>	2.236	.339	6.603
<b>H1**</b>	International	.136	.046	2.949
	Experience			
	Product Technology	−.064	.062	−1.053
<b>H3†</b>	Internationalization	.009	.033	.281
	Market Share	.243	.038	6.347
	Environmental	.032	.010	3.259
<b>Pricing strategy</b>	Factors			
				<b>Wald</b>
<b>H6—Transfer**</b>	Internal	.595	.309	3.712
<b>H7—Cost-plus***</b>	Internal	.750	.274	7.499
<b>H8—Parity*</b>	External	.400	.218	3.371
<b>H9—Second market*</b>	External	.433	.243	3.184
<b>H10—Low price supplier**</b>	External	.536	.263	4.166
<b>H11—Complementary**</b>	External	.493	.240	4.239

\*  $p < .10$ .

\*\*  $p < .05$ .

\*\*\*  $p < .01$ .

† Not hypothesized.

et al., 1999). Implementing pricing strategies are different from strategies examined in previous studies; however, pricing strategies are often implemented quickly in response to price moves of larger firms and other transient fluctuations in price (Smith, Sinha, Lancioni, & Forman, 1999).

The results pertaining to the second hypothesis were also supportive. Market factors were significant in determining pricing strategies ( $p < .05$ ;  $B = .073$ ;  $t = 1.547$ ), while there was no significant relationship with internal factors (Table 3). Products with shorter product life cycles require the use of pricing strategies which are established to segment the market with particular regard to elasticity of demand and to take advantage of Innovators' (Rogers, 1995) willingness to purchase new products at inflated prices. An external orientation is required to be able to determine where a product is in its life cycle as well as the nature of the adopters.

Support for H3 is somewhat equivocal. The regression results indicate marginal support for managerial emphasis on external factors when developing pricing strategies ( $p < .1$ ;  $B = .061$ ;  $t = 1.789$ ). However, the relationship between internationalization and the use of internal factors is not significant (Table 3). This hypothesis suggests support

for the notion that firms with a stronger international focus are willing to dedicate resources to understand external market factors to maximize the impact of their pricing strategies.

H4a is supported at ( $p < .001$ ;  $B = .137$ ;  $t = 3.486$ ). H4b is also supported at ( $p < .001$ ;  $B = .243$ ;  $t = 6.347$ ). This suggests that a positive relationship exists between market share and reliance on both internal and external factors. Fighting off competitors requires a balance of being able to accurately scan the competitive market and managing internal factors. Firms with larger market shares are not only in a better position to focus internally and externally, but they must do it if they are to successfully fend off the competition.

H5a is supported at ( $p < .01$ ;  $B = .062$ ;  $t = 6.058$ ). H5b is also supported at ( $p < .01$ ;  $B = .032$ ;  $t = 3.259$ ), suggesting the pervasiveness of environmental forces as important factors juxtaposed beside key internal factors. An open systems approach suggests that organizations will, in the context of specific exogenous factors, apply them to internal operational factors to better fit the demands of the decision environment. These internal changes will ultimately lead to the selection and implementation of appropriate internally based pricing strategies. Support for H6 and H7 regarding transfer pricing and cost-plus pricing ( $p < .05$ ;  $B = .595$ ; Wald = 3.712 and  $p < .01$ ;  $B = .750$ ; Wald = 7.499, respectively) suggests that internal factors are important predictors of the likelihood that these two pricing strategies will be used.

H8 and H9 propose that parity pricing and second market strategies are based on external decision-making factors. Both are supported ( $p < .06$ ;  $B = .400$ ; Wald = 3.371 and  $p < .07$ ;  $B = .433$ ; Wald = 3.184, respectively). Rosnow and Rosenthal (1989) suggest that  $p$ -values in excess of .05 contain valuable information and are worthy of reporting from an ontological perspective since there is no demarcation between "significant" and "nonsignificant" results. Accordingly, the data exhibit at least marginal support for these hypotheses, and thus suggest that external factors are antecedents of parity and second market pricing strategies.

H10 involving low price supplier strategies is reported to be positive and significant ( $p < .05$ ;  $B = .536$ ; Wald = 4.166), suggesting that to pursue a low price supplier strategy firms need a firm understanding of the market. An internal focus would be insufficient for such firms because it ignores the critical elements of competitors' prices and consumers' price perceptions.

Finally, H11 relating external decision-making factors to complementary pricing is significant ( $p < .05$ ;  $B = .493$ ; Wald = 4.239). The success of this pricing strategy is contingent on understanding the behavioral dimensions of the target market. In particular, it is important for pricing managers to recognize the relationship between these products in the context of how they are used and consumed. Most importantly, it is incumbent on managers to under-

stand customer repurchase activities surrounding the relevant set of complementary products.

## 9. Discussion and managerial implications

As suggested by Kortge et al. (1994), pricing decisions in the international arena are decisions replete with uncertainty. This study presents preliminary results regarding how managers deal with such uncertainty, paying particular attention to factors thought to influence choice of international pricing strategies. By exploring managers' consideration of key internal and external decision factors, the research presented here demonstrates that managers' focus, if not their frame of reference, influences their selection of pricing strategy. Specifically, results indicate that international experience, product technology, degree of exogenous environmental factors, internationalization, and market share can influence the weight given to internal and external factors when making international pricing decisions. Furthermore, these decision-making factors directly affect which specific pricing strategies managers employ. To the extent that the hypotheses tested were grounded in the literature on strategic decision-making, their support offers a reasonable degree of generalizability across the spectrum of international strategic management.

For the international marketing manager, these results indicate that findings related to strategic process as delineated in the existing body of research on international strategy should prove viable in developing international pricing strategy. This is consistent with the growing theoretic and empirical support for the importance of aligning strategic thought and processes at the functional and subunit level with the overall corporate strategic architecture—the notion of a dominant logic (Bettis & Prahalad, 1995) or shared values (Nohria & Ghoshal, 1994).

In identifying key factors influencing pricing strategies, the study also suggests that pricing managers actually use appropriate pricing strategies in terms of their perceptions regarding the relevance of internal and external decision-making factors. Thus, having a clearer understanding of the decision-making determinants and their implications for developing pricing strategies should assist managers in formulating international pricing strategies. An examination of the determinants of these decision-making factors suggests that organizations need to have a good and accurate understanding of these determinants and how they relate to both internal and external decision-making factors. This will include developing processes to improve information gathering about important environmental factors and market share. Inaccuracies in data collection may lead to pricing strategies that do not meet organizations' goals and objectives.

Decision-makers also should be aware of how external factors such as international experience can influence pricing decisions. Similarly, managers should consider the manner in which product technology and demand

characteristics influence how decision-making factors interplay with selection of pricing strategy. For example, as noted above, many products are currently changing at a rapid pace (even within the four-digit 35 S.I.C.); selling such products can be fraught with complications—i.e., a specific pump may be the state of the art in one market, but and one generation behind in another. Thus, to fully cope with the ramifications of pricing strategy, managers must be able to understand the amalgam formed by internal and external decision-making factors and its resultant influence on the price selection process.

Despite the encouraging results of this study, its design carries with it certain constraints that limit the study's external validity. The sample included only firms from a very narrow industry range (four-digit SIC 35); this research should be expanded to include a variety of industries such as other industrial products, consumer products, rising, mature, and service industries. In addition, this study focused on the underpinnings of the pricing *decision process* and the factors that influence that process rather than on the *outcome* of the process. Similarly, this study did not examine performance implications of the pricing strategy decisions, an issue of substantial practical interest for both general and marketing managers of international firms.

The opportunities for future research in this area are many, and will offer useful insight into this very important strategic variable. While it appears that managers actually select appropriate pricing strategies, it is still not known how well these strategies meet overall corporate goals. No doubt, research into the relative success of these strategies will be of interest to academics and practitioners alike as well as spawn a fecund area of inquiry. Continuance of this research might help uncover the entire sequence through which the prototypic factors presented here are transformed into managerial decisions that optimize the competitive impact of strategic decisions.

## Appendix A. Scale item and descriptive statistics by construct

### International experience

Var	Mean	S.D.	Item Wording
EXP1	4.15	1.89	How many years have you been in the this industry?
EXP2	20.00	1.52	How many countries is your company currently selling this product?
EXP3	16.10	1.99	How many years has your company been selling internationally?

### Product technology

Item Wording
How often does your company change any attribute(s) of your product (i.e., develop a new/improved model)? Every 2+ years ____ 1–2 years ____ Annually ____ Shorter than 1 year ____

### Environmental factors

Var	Mean	S.D.	Item Wording
ENV1	3.05	1.92	The effect of exchange rates was:
ENV2	2.92	1.68	The effect of the foreign level of inflation was:
ENV3	3.35	1.81	The effect of tariffs was:
ENV4	2.86	1.71	The effect of foreign government intervention (other than tariffs) was:

### Degree of internationalization

Var	Mean	S.D.	Item Wording
INTL	2.99	1.67	What is the percentage of your company's total sales come from foreign countries?

### Market share

Var	Mean	S.D.	Item Wording
MKT	3.99	1.67	Your company's market share was:

### External factors

Var	Mean	S.D.	Item Wording
EXT1	3.40	1.45	The effect of customer switching costs:
EXT2	4.78	1.42	The effect of the price sensitivity of the customers for this product was:
EXT3	3.88	1.62	The effect of barriers to entry was:

### Internal factors

Var	Mean	S.D.	Item Wording
INT1	4.19	1.60	Effect of factory capacity utilization was:
INT2	4.02	1.24	Compared to my competition, my firm's cost structure was:
INT3	4.36	1.75	The profit contribution of this product to the company was:

## Appendix B. Pricing strategies

Low price supplier	This is a pricing strategy whereby firms strive to be the lowest price in the market.
Parity pricing	This is a pricing strategy whereby products are priced to match the prices of the market leader or the market prices in the absence of a market leader.
Second market	This is a pricing strategy whereby prices charged in the foreign market are discounted to a price level <i>lower</i> than the domestic price levels.
Transfer	This is a strategy whereby goods are sold within a corporation (i.e. from one division to another in a foreign country).
Cost-plus	This is a strategy whereby prices are developed by determining the costs of the product and adding a pre-determined markup to the cost.
Complementary product	This is a pricing strategy whereby a main product is priced at a relatively low pricing strategy level and the complementary products (any associated accessories, supplies, or parts etc.) are priced at higher profit margins.

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