

In a broad cross section of consumer goods businesses, market pioneers generally have substantially higher market shares than late entrants. In fact, the empirical association between order of entry and market share is almost as strong as the association between market share and return on investment. The authors examine theoretical sources behind this relationship. The empirical results suggest that the higher pioneer shares are derived from firm-based superiority as well as from consumer information advantages. Nine hypotheses are developed and tested empirically. The results also indicate that order of market entry is a major determinant of market share.

## Sources of Market Pioneer Advantages in Consumer Goods Industries

Some market pioneers in consumer goods industries such as Birds Eye, Campbell, Coca-Cola, Goodyear, Hallmark, Kleenex, and Wrigley have been market leaders for decades. However, other pioneers have fallen rapidly from their initial leadership position. Unsuccessful pioneers include Reynolds International Pen (ballpoint pens), Bowmar Instrument (hand-held electronic calculators), Royal Crown Cola (diet and caffeine-free colas), and Advent (large-screen television) (*Business Week* 1983; *The New Yorker* 1951; *The Wall Street Journal* 1982a,b). Given these examples and counterexamples, what is the general relationship between order of market entry and market share in consumer goods markets? What factors can lead to an order-of-entry advantage?

Our research addresses these questions, extending prior research in two ways. First, the study considers both frequently and infrequently purchased goods and high-priced and low-priced goods. Second, an attempt is made to

identify sources of long-lived pioneer advantages. Prior research on consumer goods (Urban et al. 1983) found a strong relationship between order of entry and brand market share. This research focused on low-priced, frequently purchased consumer goods. The order-of-entry relationship was assumed to be due to consumer information advantages (Lane and Wiggins 1981; Schmalensee 1982).

In our research, theoretical arguments based on industrial organization economics are used to develop and test nine hypotheses about first-mover advantages for market pioneers. The empirical evidence indicates that both consumer-based and firm-based factors result in long-term market share advantages for pioneers relative to late entrants. Overall, the results suggest that order of entry is a major determinant of market share for a broad cross section of consumer goods businesses.

### THREE AVENUES TO HIGHER PIONEER MARKET SHARES

A market pioneer is defined as the first entrant in a new market (e.g., see Schmalensee 1982). Theoretical arguments from the barriers-to-entry literature are organized hereafter to show how, in relation to late entrants, pioneers can retain higher market shares. This literature is useful because even after entry has taken place, the factors producing entry barriers can provide pioneers with sustainable competitive advantages.

Economic sources of entry barriers are classified by Bain (1956) as arising when established firms have (1)

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product differentiation, (2) absolute cost, or (3) scale economy advantages over potential entrants. Because sources of entry barriers vary widely, these categories range from patent protection to advertising to control of scarce natural resources.

Similar to Bain's classification, Figure 1 suggests three basic ways in which a market pioneer can achieve a higher market share. First, with relative direct costs held constant, market pioneering may lead to long-lived marketing mix advantages. From Bain's perspective, these represent product differentiation advantages arising from the supply side of the market. To incorporate competitive forces, these marketing mix advantages are assessed relative to competition. Obviously, a stronger relative marketing mix may lead to a higher market share.

Second, market pioneering may lead to direct cost savings (purchasing, manufacturing, and physical distribution expenditures) relative to competition. These direct cost savings can be based on (1) absolute cost or (2) scale economy advantages. If some portion of the relative direct cost savings is used to provide a more attractive marketing mix, pioneers can achieve higher shares.

Third, market pioneering may yield relative consumer information advantages by way of product experience or familiarity, which, in turn, may provide market pioneers with higher market shares (Schmalensee 1982). From Bain's perspective, these represent a product differentiation advantage arising from the demand side of the market.

In Figure 1, the relative marketing mix is *not* hypothesized to influence relative consumer information. The marketing mix can, of course, provide information to consumers through advertising, packaging, etc. Infor-

mation provided by the marketing mix is modeled as having a direct impact on market share. In the figure, we are attempting to isolate information from product experience (Schmalensee 1982).

Figure 1 represents the *theoretical* model specification. The following 5-equation model represents its *operationalization*. In estimating the model, we added several explanatory variables, both exogenous and endogenous, to (1) reduce the risk of finding spurious relationships and (2) to identify the 5-equation system. (Tracing through this model is simplified as one reads the hypotheses presented subsequently.)

$$(1) \quad MS = \gamma_{10} + \beta_{11}PQ + \beta_{12}PLB + \beta_{13}P \\ + \gamma_{11}PLP + \gamma_{12}PHPF + \gamma_{13}PLCSI \\ + \gamma_{14}PLPF + \gamma_{15}PSC \\ + \gamma_{16}PAPC + \gamma_{17}PIIA + \epsilon_1$$

$$(2) \quad PQ = \gamma_{20} + \beta_{21}DC + \gamma_{21}PION \\ + \gamma_{22}20YRP + \gamma_{23}EF + \epsilon_2$$

$$(3) \quad PLB = \gamma_{30} + \beta_{31}DC + \gamma_{31}PION \\ + \gamma_{32}20YRP + \gamma_{33}EF + \epsilon_3$$

$$(4) \quad P = \gamma_{40} + \beta_{41}DC + \gamma_{41}PION \\ + \gamma_{42}20YRP + \gamma_{43}EF + \epsilon_4$$

$$(5) \quad DC = \gamma_{50} + \beta_{51}MS + \gamma_{51}PION \\ + \gamma_{52}20YRP + \gamma_{53}EF + \epsilon_5$$

where the  $\beta$  and  $\gamma$  parameters are used to test the hypotheses and  $\epsilon_1$  through  $\epsilon_5$  represent random error terms.

Endogenous variables are:

$MS$  = market share,

$PQ$  = product quality relative to competition,

$PLB$  = product line breadth relative to competition,

$P$  = price relative to competition, and

$DC$  = direct costs (purchasing plus manufacturing plus physical distribution costs) relative to competition.

The order-of-entry dummy variables are:

$PION$  = 1 if the business is a market pioneer, 0 otherwise,

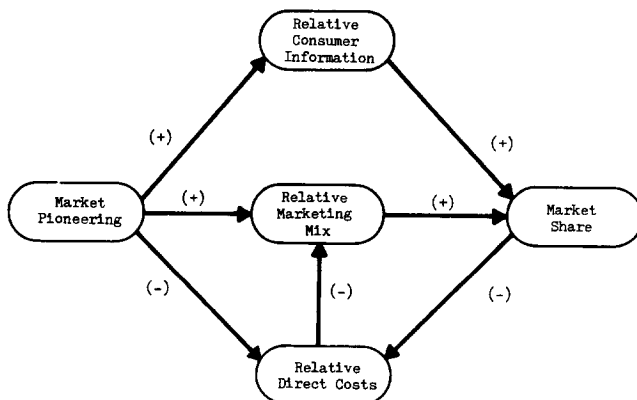
$20YRP$  = 1 if the business is a market pioneer and has been in the market 20 years or more, 0 otherwise, and

$EF$  = 1 if the business is an early follower, 0 otherwise.

In the model, a business is classified as either a market pioneer, early follower, or late entrant. The pioneer and early follower dummy variables permit a comparison showing pioneer advantages over late entrants. (These are also included in the market share equation as additional explanatory variables.)  $20YRP$ , the dummy variable for pioneers who have been in the market 20 years or longer, assesses the decline of pioneer advantages over time.

The pioneer industry characteristics are:

Figure 1  
THREE SOURCES OF MARKET PIONEER ADVANTAGES  
AND HYPOTHESIZED DIRECTION OF RELATIONSHIPS<sup>a</sup>



<sup>a</sup>For simplicity, this figure represents only the key variables in the model. The complete model specification includes additional explanatory variables and random error terms.

- $PLP = 1$  if the business is a pioneer and sells low-priced products, 0 otherwise,  
 $PHPF = 1$  if the business is a pioneer and sells products that have a high level of purchase frequency, 0 otherwise,  
 $PLCSI = 1$  if the business is a pioneer and customer service has little or no importance, 0 otherwise,  
 $PLPF = 1$  if the business is a pioneer and sells products that have a low level of purchase frequency, 0 otherwise,  
 $PSC = 1$  if the business is a pioneer and sells products that are changed seasonally, 0 otherwise,  
 $PAPC = 1$  if the business is a pioneer and sells products that are changed on an annual or periodic basis, 0 otherwise, and  
 $PIIA = 1$  if the business is a pioneer and the industry engages in intensive advertising, 0 otherwise.

These dummy variables assess pioneer market shares across different types of consumer goods industries. Dummy variables are used because the following theoretical arguments indicate dichotomous rather than linear relationships.

#### MARKET PIONEERING AND RELATIVE MARKETING MIX

The first potential avenue for higher pioneer share levels, *with relative direct costs held constant*, derives from product, distribution, promotion, or price advantages, which are examined in relation to late entrants. Following the formulation of the hypotheses is a presentation of the theoretical and/or empirical support.

##### Market Pioneering and Relative Product

The firm's product offering can be viewed as being composed of product quality and breadth of the product line.

- $H_1$ : Higher product quality increases market share ( $\beta_{11} > 0$ ) and market pioneers tend to have higher product quality ( $\gamma_{21} > 0$ ).

If experience effects are present in an industry, market pioneers can benefit from early entry and provide a superior product for the same cost as competitors' lower quality products (Abell and Hammond 1979; Yelle 1979). Also, if early entry gives pioneers an opportunity to gain broad distribution, and dealers have an important role in customer service, customer service quality advantages can arise (Bain 1956). In addition, simply being a pioneer can provide a favorable product image (Porter 1980).

An alternative hypothesis could be posited, in that pioneer product quality advantages are not sustainable ( $\gamma_{21} \leq 0$ ). The benefits of having more experience than competitors may become insignificant once cumulative volume reaches a certain point. At the maturity stage of the product life cycle, quality may be so uniform that "products approach a familiar commodity status" (Day 1981). In addition, late entrants may be able to surpass pioneer technology and provide the highest product quality in the market (Porter 1980). Image advantages can also operate

against pioneers if they "grow to look old fashioned against new and peppier rivals" (Kotler 1980, p. 273). The second hypothesis focuses on product line breadth.

- $H_2$ : Broader product lines increase market share ( $\beta_{12} > 0$ ) and market pioneers tend to have broader product lines ( $\gamma_{31} > 0$ ).

Early entry can enable pioneers to develop broader product lines than late entrants. Market pioneers can develop and position products for the largest and most lucrative segments and leave the smaller and less desirable market niches for late entrants (Prescott and Visscher 1977; Schmalensee 1978). In fact, given (1) scale economies at the brand level, (2) localized rivalry, and (3) costly repositioning, it is likely that pioneers can protect their market shares more effectively by broadening their product line than by limit pricing.

However, if late entrants can surpass pioneer technology or have a more favorable image, this advantage may be extended by developing broad product lines ( $\gamma_{31} \leq 0$ ). In view of these competing arguments, empirical testing is necessary to assess the general tendency between order of market entry and (1) product quality and (2) product line breadth.

##### Market Pioneering and Relative Distribution

- $H_3$ : Because of distribution advantages, pioneers have higher market shares in industries where the product has a low price ( $\gamma_{11} > 0$ ) and high purchase frequency ( $\gamma_{12} > 0$ ), and where customer service is not important ( $\gamma_{13} > 0$ ).

For convenience goods, it may be easier for pioneers to gain intensive distribution (Porter 1974) and pioneers may be able to dominate scarce retail shelf space (White 1983). These distribution advantages may not be as great for nonconvenience goods. Because convenience goods are typically low priced and have high purchase frequency, and customer service is of relatively little or no importance to the end user, pioneers are predicted to benefit in these types of industries.

##### Market Pioneering and Industry Advertising

- $H_4$ : Pioneers tend to have higher market shares in industries with intensive advertising ( $\gamma_{17} > 0$ ).

Comanor and Wilson (1974, 1979) argue that industries with high advertising-to-sales ratios have substantial barriers to entry. They state that "advertising effectiveness should depend on who came first in the market, for these responses are surely influenced by consumer experience with the product as well as by the aggregate volume of competing advertising messages" (p. 455). Thus, late entrants may face difficulties with consumer response due to (1) a lack of experience with their product and (2) having to "shout louder to be heard." Advertising economies of scale also can favor pioneers if the market is too small for late entrants to benefit from economies in purchasing or from economies associated

with advertising message generation. In addition, capital costs may be especially high for advertising expenditures, because there is no salvage value if a late entrant is unsuccessful.

An alternative hypothesis again can be posited ( $\gamma_{17} \leq 0$ ), in this case if advertising is viewed as a source of consumer information (Lynk 1981; Telser 1964). Information provided by advertising can reduce consumer uncertainty about a late-entrant brand. Thus, informed consumers may be more likely than uninformed consumers to switch to a late-entrant brand. In this context, advertising is viewed as a means of market entry rather than as a barrier to entry.

#### *Market Pioneering and Relative Price*

Do pioneers retain high market shares by charging prices at or below those of late entrants? Under the *ceteris paribus* condition that direct costs as well as other elements of the marketing mix are held constant, the hypothesis is:

- H<sub>5</sub>: Lower prices increase market share ( $\beta_{13} < 0$ ) and market pioneers tend to charge lower prices ( $\gamma_{41} < 0$ ).

As mentioned before, pioneers have an opportunity to aim at the largest and most lucrative segments and leave the smaller and less desirable market niches for later entrants. Typically, businesses which enter market niches charge a relatively high price for the specialized offering they provide (Kotler 1980). Accordingly, pioneers may charge lower prices than late entrants.

Nevertheless, an alternative hypothesis can be suggested ( $\gamma_{41} \geq 0$ ). Even with an equivalent nonprice offer, pioneers may charge higher prices than late entrants if variances in price elasticity are present within the market. For example, late entrants may undercut pioneer prices and appeal to a price-sensitive segment, while the pioneer charges a higher price and appeals to a price-insensitive segment (Bond and Lean 1977). In addition, consumer information advantages may enable pioneers to charge higher prices (Schmalensee 1982).

#### *MARKET PIONEERING AND RELATIVE DIRECT COSTS*

The second potential avenue for higher pioneer market share levels is the market pioneers' ability to achieve direct cost (purchasing, manufacturing, and physical distribution expenditures) savings based on absolute cost and scale-related advantages. Thus, total pioneer direct cost savings equal the sum of the absolute plus scale-based savings. If pioneers have direct cost savings, and if a portion of the cost savings is channeled into providing more for the customer through the marketing mix, market share should increase.

#### *Absolute Cost Advantages*

- H<sub>6</sub>: Because of absolute cost advantages, pioneers have lower direct costs ( $\gamma_{51} < 0$ ), which lead to a stronger

marketing mix ( $\beta_{21}, \beta_{31} < 0, \beta_{41} > 0$ ) and higher market shares ( $\beta_{11}, \beta_{12} > 0; \beta_{13} < 0$ ).

For absolute cost advantages, which are independent of the scale of operations, the principal sources are categorized by Bain (1956) as (1) production techniques, (2) management skills and production know-how, (3) supplies of natural resources, and (4) capital costs. Differences between firms in terms of production techniques can be based on process patents or trade secrets (Bain 1956) or experience curve advantages (Spence 1981). Because learning effects in an organization can influence labor skills (Yelle 1979), pioneers can have superior management skills and production know-how.

Again, an alternative hypothesis can be defended ( $\gamma_{51} \geq 0$ ). One can argue that experience or learning advantages are not sustainable because (1) experience curves tend to flatten with high cumulative volumes, (2) it is difficult to keep cost-reduction techniques proprietary for an extended period of time, and (3) in many markets where experience is important, rapid technological change can render experience advantages obsolete (Scherer 1980).

#### *Scale Advantages*

- H<sub>7</sub>: Because of scale economy advantages, pioneers have lower direct costs ( $\beta_{51} < 0$ ), which lead to a stronger marketing mix ( $\beta_{21}, \beta_{31}, < 0; \beta_{41} > 0$ ) and higher market shares ( $\beta_{11}, \beta_{12} > 0; \beta_{13} < 0$ ).

Being the first mover in the market, the pioneer may have an opportunity to benefit from economies of scale. If late entrants attempt to match the pioneer's size, the large addition to total industry output can depress industry prices to the extent that large-scale entry is unprofitable. Thus, late entrants may consider small-scale entry in market niches where consumer needs are not effectively satisfied.

#### *MARKET PIONEERING AND RELATIVE CONSUMER INFORMATION*

The third potential avenue to higher pioneer market shares arises from the demand rather than the supply side of the market. Drawing heavily on the work by Schmalensee (1982), we posit that

- H<sub>8</sub>: Because of consumer information advantages, pioneers have *higher* shares in industries where the product has a low price ( $\gamma_{11} > 0$ ) and is purchased infrequently ( $\gamma_{14} > 0$ ) and *lower* shares in industries where products are changed on a seasonal ( $\gamma_{15} < 0$ ) or on an annual or periodic basis ( $\gamma_{16} < 0$ ).

Schmalensee (1982) shows that "rational buyer behavior in the face of imperfect information about product quality can give long-lived advantages to pioneering brands" (p. 349). Here consumer learning, based on product usage, provides the pioneer with an information advantage over later entrants. In a marketing context, these advantages would lead to (1) greater brand name awareness for pioneering brands and (2) a greater pro-

portion of consumers including pioneering brands in their evoked set. These information advantages also can lead to savings in the advertising and promotion budget (For-nell, Robinson, and Wernerfelt 1985).

The strength of the consumer information advantage for pioneers can vary widely across different types of industries. Schmalensee predicts that these advantages will be greater in industries where the product has a low purchase price and low purchase frequency. For products with a high purchase price, consumers can be expected to use more information sources and thus the pioneer information advantage is reduced. Low purchase frequency aids pioneers, because the expected consumer benefits from brand switching are relatively small.

One assumption which can be relaxed in the Schmalensee model is that product characteristics are stable over time. In industries where products are changed frequently, consumers may not rely as heavily on previous purchases for information as they do in industries where product characteristics are stable. Thus, pioneer information advantages may decrease as the frequency of product change in an industry increases.

#### PIONEER MARKET SHARE LEVELS AND TIME

H<sub>9</sub>: A deterioration of pioneer product quality ( $\gamma_{22} < 0$ ), product line breadth ( $\gamma_{32} < 0$ ), price ( $\gamma_{42} > 0$ ), and absolute cost advantages ( $\gamma_{52} > 0$ ) over time leads to lower pioneer shares.

In many industries, pioneer market share levels have deteriorated over time (Bond and Lean 1977; Cleary 1981; Whitten 1979). If pioneers, as previous research indicates, generally hold higher market shares, it is anticipated that those share advantages will slowly deteriorate. Product quality, product line breadth, price, and absolute cost advantages are all areas for potential deterioration. Possible deterioration in other areas such as distribution (H<sub>3</sub>), advertising (H<sub>4</sub>), and consumer information advantages (H<sub>8</sub>) could not be estimated because of data limitations.

#### DATA

The PIMS (Profit Impact of Market Strategies) data at the business-unit level of analysis are used to test the hypotheses. The sample in our study is restricted to consumer goods businesses in the maturity stage of the product life cycle. Only consumer goods businesses are used because several of the hypotheses are based on consumer buyer behavior (i.e., H<sub>3</sub>, H<sub>4</sub>, and H<sub>8</sub>). The maturity stage of the product life cycle is used to assess long-term advantages. The observations are four-year averages.

Certain limitations of the PIMS data and their impact on this study should be recognized. First, the sample is self-selected with most business units belonging to *Fortune* 500 firms. Thus, the pioneers and late entrants should be more successful, better managed, and better financed than a typical random sample of businesses (Buzzell 1981).

This sampling bias limitation biases pioneer share levels upward. Therefore, pioneer share levels are examined *relative* to late entrant share levels, for which the sampling bias operates in the same manner. Unless there is a reason to suspect that one bias is greater than the other, the biasing effects cancel out.

Another sampling bias issue concerns the fact that the pioneers are all successful in the sense that they (1) attempted to pioneer a market and succeeded and (2) remained in the market, typically for two decades or longer. Because failures in creating new markets are not recognized, overall performance for attempting to pioneer new markets cannot be assessed. Consequently, the results clearly overstate the returns for attempting to pioneer a market. Previous studies suggest that pioneer market withdrawal is rare (Bond and Lean 1977; Urban et al. 1983; Whitten 1979).

Though our study is limited to an analysis of successful pioneers, and in this sense overstates the average pioneer market share, this bias should not affect the hypothesis testing. The hypotheses address the sources of returns to pioneers, and there is no reason to assume that the relative importance of these sources would be biased by an overestimation of the total return.

#### Key Variables and Definitions

The six major variables used in the study are shown in Table 1. Market share is defined as the business unit's share of sales in the served market. The served market covers "only the specific products or services, customer types, and geographic areas in which a business actually competes" (*PIMS Data Manual* 1978, p. 1–2). Order of market entry is a categorical measure that classifies a business as a market pioneer, an early follower, or a late entrant. The PIMS order of market entry definition is based on the time the business first entered the market, with a market pioneer defined as "one of the pioneers in first developing such products or services."

Table 2 describes the key industry characteristics used to test H<sub>3</sub>, H<sub>4</sub>, and H<sub>8</sub>. Dummy variables are used because the theoretical arguments suggest dichotomous rather than linear relationships. The various industry measures are combined with the pioneer dummy variable to assess industries where pioneers are expected to gain and to lose share. Because the derivation of the purchase frequency and the industry advertising intensity measures is not straightforward, a brief discussion of these measures is provided.

The distribution advantage hypothesis (H<sub>3</sub>) predicts that pioneers benefit in markets with high purchase frequency, whereas the consumer information hypothesis (H<sub>8</sub>) predicts that pioneers benefit in markets with low purchase frequency. If both hypotheses have merit, pioneers should have the lowest shares in markets with a moderate level of purchase frequency. Consequently, purchase frequency is classified as being either high, medium, or low.

Pioneers are hypothesized to have higher shares in in-

**Table 1**  
**KEY FIRM VARIABLES AND DEFINITIONS**

<i>Variable</i>	<i>Definition<sup>a</sup></i>
Market share	Market share is the share of the <i>served</i> market accounted for by this business.
Order of market entry	At the time this business first entered the market, was it. 1. One of the pioneers in first developing such products or services? 2. An early follower of the pioneer(s) in a still-growing, dynamic market? 3. A later entrant into a more established market situation?
Relative product quality	Estimate the percentage of this business's sales volume accounted for by products and services that, <i>from the perspective of the customer</i> , are assessed as "superior," "equivalent," and "inferior" to those available from the three leading competitors. Relative product quality is the percentage superior less the percentage inferior.
Relative product line breadth	Relative to the weighted average of the product lines of the three largest competitors, estimate the breadth of the product line of this business. 1. Narrower 2. Same 3. Broader
Relative price	Estimate the average level of selling prices of this business's products and services, relative to the average level of the three largest competitors (Average for leading competitors = 100% )
Relative direct costs	Estimate the average level of this business's direct costs per unit of products and services relative to the average level of the three largest competitors. Include costs of materials, production, and distribution, but exclude marketing and administrative costs (Average for leading competitors = 100% )

<sup>a</sup>Variable definitions are from the PIMS Data Forms and the *PIMS Data Manual* (1978)

dustries with intensive advertising ( $H_4$ ). An industry advertising intensity measure is not available in PIMS and was constructed by combining four measures, (1) the business's advertising-to-sales ratio, (2) the business's advertising as a percentage of sales relative to competitors', (3) the business's market share, and (4) the competitors' market share. If the estimate of the industry advertising-to-sales ratio is greater than or equal to 5%, the industry is classified as engaging in intensive advertising.

#### DESCRIPTIVE STATISTICS

Descriptive statistics provide insight into the empirical association between order of entry and market share. Across the 371 mature consumer goods businesses in PIMS, pioneers have an average market share of 29%, early followers 17%, and late entrants 12%. In descrip-

tive terms, order of entry alone accounts for 18% of the variation in market share.<sup>1</sup>

To gain perspective on the strength of this empirical association, we compare it with the association between market share and return on investment (ROI). In the sample used here, market share accounts for 21% of the variation in ROI. Thus, the association between order of entry and market share is almost as strong as the widely discussed and debated association between market share and ROI. In the structural analysis we attempt to explain this strong empirical association.

#### MODEL SPECIFICATION AND ESTIMATION

Market share models typically are specified as either linear, multiplicative, or attraction models (Naert and Weverbergh 1981). The PIMS measures do not permit an attraction type of specification. Because of the large number of categorical variables, the linear rather than multiplicative model specification was chosen.

Explanatory variables are added to identify the model and to reduce specification error problems. The operational definitions of these variables are given in Table 3. Overall, the results of the hypothesis testing are very robust to the explanatory variable selection. In fact, when all of the additional variables are eliminated and the model

<sup>1</sup>Order of entry alone explains 32% of the variation in market share in Urban et al. (1983). In view of the independence of these two data bases, sampling bias associated with the PIMS data seems unlikely to be causing this strong empirical association.

**Table 2**  
**KEY INDUSTRY CHARACTERISTICS**

<i>Variable<sup>a</sup></i>	<i>Definition</i>
Pioneer low price	1 if the business is a pioneer and the purchase price for the product is less than \$10 00, 0 otherwise
Pioneer high purchase frequency	1 if the business is a pioneer and the product is purchased once a month or more, 0 otherwise
Pioneer low customer service importance	1 if the business is a pioneer and customer service is of relatively little or no importance to the end user, 0 otherwise
Pioneer low purchase frequency	1 if the business is a pioneer and the product is purchased once a year or less, 0 otherwise
Pioneer seasonal product change	1 if the business is a pioneer and all or part of the product line is changed on a seasonal basis, 0 otherwise
Pioneer annual/periodic product change	1 if the business is a pioneer and all or part of the product line is changed on an annual or periodic basis, 0 otherwise
Pioneer intensive industry advertising	1 if the business is a pioneer and the industry advertising-to-sales ratio is greater than 5%, 0 otherwise

<sup>a</sup>See Abell and Hammond (1979, p 291-320) for additional information about these industry characteristics

**Table 3**  
**ADDITIONAL EXPLANATORY VARIABLES**

<i>Variable</i>	<i>Definition<sup>a</sup></i>
Number of competitors	Relative to the last year of data being entered, approximately how many competing businesses were in the served market? Ignore competitors with less than 1% of the served market 1 = 1-5 2 = 6-10 3 = 11-20 4 = greater than 20
Relative advertising and promotion	Relative to leading competitors, how much did this business spend, as a percentage of sales, on advertising and sales promotion? 1 = much less 2 = somewhat less 3 = about the same 4 = somewhat more 5 = much more
Percentage new products	What percentage of the total sales for this business was accounted for by products introduced during the 3 preceding years?
Relative customer type	Estimate the breadth of this business's served market, relative to the average of its 3 leading competitors 1 = less than competitors 2 = same as competitors 3 = more than competitors
Relative number of customers	Same as above except for number of customers instead of customer type
Relative customer size	Same as above except for customer size instead of customer type
Number of immediate customers	Approximately how many immediate customers were served by the business? 1 = 3 or fewer      5 = 50-99 2 = 4-9              6 = 100-999 3 = 10-19            7 = 1000-9999 4 = 20-49            8 = 10,000 or more
Plant and equipment newness	The net book value of plant and equipment divided by the gross book value
Capacity utilization	The average percentage of standard capacity utilized
Relative backward vertical integration	Compare the degree of backward vertical integration of this business with that of its leading competitors 1 = less 2 = same 3 = more
Employee productivity	The average level of value added per employee, where value added equals sales less purchases.
Percentage employees unionized	The percentage of the employees of this business who are unionized

<sup>a</sup>Variable definitions are from the PIMS Data Forms and the *PIMS Data Manual* (1978)

is estimated by OLS, identical conclusions emerge. The only exception is for  $H_5$ , the relative price hypothesis, and it is discussed in the Results section.

As is well known in applied econometrics, theory rarely provides a complete specification for one's model (see Theil 1971, p. 542). Consequently, the explanatory vari-

able selection is based on (1) the barriers-to-entry literature, (2) other previous research, and (3) general principles of marketing and industrial organization economics. (See, e.g., Kotler 1980; Scherer 1980.)

In the market share equation, the additional explanatory variables are (1) the pioneer, 20-year pioneer, and early follower dummy variables, which control for order-of-entry effects that are not included in the model, (2) number of competitors, because the greater the number of competitors in a market, by definition, the lower the average market share will be, and (3) relative advertising and promotion expenditures.<sup>2</sup>

In the relative product quality equation, the control variables are (1) relative price, (2) relative advertising and promotion, and (3) percentage of new products.<sup>3</sup> Consumers may perceive a high-priced product as having higher product quality (Monroe and Krishner 1982). Increases in advertising and promotion and new product introductions could also increase product quality.

In the relative product line breadth equation, the additional explanatory variables are the percentage of new product introductions, as well as three measures of served market breadth. New product introductions should broaden the product line. Also, having a broad served market may require a broad product line to effectively serve different consumer preferences, perceptions, and incomes. In PIMS, served market breadth is measured in terms of relative customer types, relative number of customers, and relative customer size.

In the relative price equation, three marketing mix variables are added, (1) relative product quality, (2) relative advertising and promotion, and (3) percentage of new products. Market share and number of immediate customers also are added to the relative price equation. Imperfectly informed consumers can reduce perceived risk by buying products from a high-share business, which can lead to higher prices charged (Smallwood and Conlisk 1979). As the number of immediate customers increases, buyer power tends to decrease, and this can lead

<sup>2</sup>One could argue that the relative advertising and promotion variable is endogenous rather than exogenous. As Theil (1971, p. 478) points out, the distinction between endogenous and exogenous variables is somewhat subjective. In applied econometrics, Theil suggests that the classification be based on whether or not the enlargement of the model by an additional equation is worthwhile. Unfortunately, this variable had too much measurement error to be useful as an endogenous variable, but had some value as an exogenous variable.

The decision to include relative advertising and promotion as an exogenous variable also was influenced by the fact that when an explanatory variable is correlated with the random error term, the estimator is biased. For this broad cross section of businesses, correlations among variables are typically very low. Thus, if Theil's basic advice is followed and a variable is treated as exogenous when in fact it should be endogenous, the result should be a low rather than high level of bias.

<sup>3</sup>The possibility of market share influencing product quality and product line breadth was examined by adding market share as an explanatory variable in both equations. Both coefficient estimates were insignificant.

to higher prices (see Scherer 1980).

In the relative direct cost equation, variables are added to assess the impact of product quality, operational efficiency, and unionization on direct costs. Operational efficiency is measured by plant and equipment newness, capacity utilization, backward vertical integration, and employee productivity; increases in each variable should lead to lower direct costs. Employee unionization can lead to higher direct costs.

The model was estimated by both two-stage least squares (2SLS) and three-stage least squares (3SLS). 3SLS estimators have an advantage in terms of asymptotic efficiency, whereas 2SLS estimators have an advantage in that model specification errors are not transferred from one equation to another. Given the broad cross-sectional nature of the PIMS data, and the corresponding risk of misspecification, comparison of the 2SLS and 3SLS estimates is useful.

The 2SLS and 3SLS results yield identical conclusions about the acceptance and rejection of the hypotheses. In general, the 2SLS estimates show *lower* pioneer advantages than the 3SLS estimates. In addition, certain 3SLS estimates seem unreasonable in size and may indicate that specification error problems are influencing certain coefficient estimates. Thus, taking a conservative ap-

proach and minimizing the risk of specification error problems, we report the 2SLS rather than the 3SLS estimates. (The 3SLS estimates will be provided on request.)

### RESULTS

The 2SLS results for the market pioneering model are reported in Table 4, as well as the variable means and standard deviations. If an alternative hypothesis is posited, the significance levels are based on a two-tail test. Otherwise, the significance levels are based on a one-tail test. Given the broad cross-sectional nature of the PIMS data, the estimates for the sources of the higher pioneer shares should be interpreted as *rough* estimates. Nevertheless, they do provide information on the economic as well as the statistical significance of the results.

H<sub>1</sub> posits that higher product quality increases market share and that pioneers tend to have higher product quality. As shown in Table 4, product quality significantly influences market share (.14), and market pioneering has a significant influence on product quality (20.99). To assess the impact of this product quality advantage on market share, the product quality coefficient of .14 is multiplied by 20.99. The resulting estimate of 2.94 market share points provides support for H<sub>1</sub>.

Table 4  
RESULTS FROM TWO-STAGE LEAST SQUARES ESTIMATION

Variable	Mean	S D	Equation <sup>a</sup>				
			Market share	Relative product quality	Relative product line breadth	Relative price	Relative direct costs
1 Constant	1 00	0 00	26.77 ( 74)	171 70 (2 12) <sup>c</sup>	5 46 (2.28) <sup>c</sup>	-18 97 (- 62) 08 (1 54) <sup>b</sup> (2 81) <sup>d</sup>	110.60 (59.11) <sup>d</sup> - 08 (-3 43) <sup>d</sup> (- 83)
2 Market share	21 92	17 18					
3 Relative product quality	24 32	28 18	14 (1 61) <sup>b</sup>				
4 Relative product line breadth	2.05	78	13 00 (5 52) <sup>d</sup>				
5 Relative price	104 20	8 91	- 25 (- 71)	1 00 (1 87) <sup>c</sup>			
6 Relative direct costs	101 50	4 88		-2 59 (-3 12) <sup>d</sup>	- 05 (-2 13) <sup>c</sup>	1 08 (3 77) <sup>d</sup>	
7 Pioneer	50	50	-2 11 (- 47)	20 99 (3 61) <sup>d</sup>	62 (4 31) <sup>d</sup>	-4 40 (-1 69) <sup>c</sup>	2 22 (1 71) <sup>b</sup>
8 20-year pioneer	42	49	-2 03 (-.67)	-10 78 (-1 92) <sup>c</sup>	- 22 (-1.63) <sup>b</sup>	46 ( 23)	-2 77 (-2 79) <sup>d</sup>
9 Early follower	28	45	-3.03 (-1 29)	6 17 (1 45) <sup>b</sup>	32 (3 23) <sup>d</sup>	-3 41 (-2.55) <sup>d</sup>	- 87 (-1 20)
10 Pioneer low price	.25	43	7 87 (2 80) <sup>d</sup>				
11 Pioneer high purchase frequency	19	39	2 29 ( 85)				
12 Pioneer low customer service importance	29	45	2 61 ( 97)				
13 Pioneer low purchase frequency	12	33	5 01 (1 65) <sup>c</sup>				
14 Pioneer seasonal product change	01	12	-9 10 (-1 39) <sup>b</sup>				



Table 4 (continued)

Variable	Mean	S.D.	Equation <sup>a</sup>				
			Market share	Relative product quality	Relative product line breadth	Relative price	Relative direct costs
15 Pioneer annual/periodic product change	13	34	-3.78 (-1.39) <sup>b</sup>				
16. Pioneer intensive industry advertising	06	25	2.13 (.63)				
17 Number of competitors	2.30	1.08	-6.63 (-9.28) <sup>d</sup>				
18 Relative advertising and promotion	2.84	1.07	1.85 (1.70) <sup>c</sup>	55 (.27)		1.67 (2.89) <sup>d</sup>	
19 Percentage new products	7.31	14.53		27 (2.72) <sup>d</sup>	- .00 (-.34)	- .01 (-.31)	
20 Relative customer type	1.97	.55			29 (3.67) <sup>d</sup>		
21 Relative number of customers	1.97	.79			25 (4.42) <sup>d</sup>		
22 Relative customer size	2.06	.59			03 (.44)		
23. Number of immediate customers	6.60	1.23				89 (2.06) <sup>c</sup>	
24 Plant and equipment newness	56.65	14.38					- .02 (-1.38) <sup>b</sup>
25 Capacity utilization	74.33	16.67					-.06 (-3.87) <sup>d</sup>
26 Relative backward vertical integration	1.89	.57					-.92 (-2.09) <sup>c</sup>
27 Employee productivity	32.10	30.14					.01 (.94)
28 Percentage employees unionized	44.09	34.12					.02 (2.14) <sup>c</sup>
R <sup>2</sup>			53	14	36	15	16

<sup>a</sup>Because 2SLS estimators follow an asymptotic normal distribution, the values in parentheses are Z-statistics

<sup>b</sup>Significant at the .10 level

<sup>c</sup>Significant at the .05 level

<sup>d</sup>Significant at the .01 level

According to H<sub>2</sub>, broader product lines increase market share and pioneers tend to have broader product lines. Product line breadth has a significant influence on market share (13.00) and market pioneering has a significant influence on product line breadth (.62). Multiplying these two coefficient values yields an estimate of 8.06 market share points and provides strong support for H<sub>2</sub>.

H<sub>3</sub> states that because of superior distribution, pioneers have higher shares in industries where the product has a low price and high purchase frequency, and where customer service is relatively unimportant. The pioneer low price dummy variable is 7.87 market share points and is statistically significant. The pioneer high purchase frequency (2.29) and low customer service importance (2.61) dummy variables are both positive, as predicted, but insignificant. Thus, there is some evidence to support H<sub>3</sub>.

H<sub>4</sub> posits that pioneers have higher shares in industries with intensive advertising. The pioneer intensive industry advertising dummy variable is positive, 2.13, but statistically insignificant. In the 3SLS results, this estimate drops to 1.58 share points and is also insignificant. Given

the small size of these coefficient estimates and the lack of statistical significance, only very weak support can be mustered for H<sub>4</sub>. This result is surprising because most empirical research in industrial organization economics addressing entry barriers focuses on industry advertising intensity (Schmalensee 1980). A possible explanation is that the industry advertising intensity measure used in previous research is confounded by consumer information and distribution-based effects, because significant positive correlations are found between these measures and the pioneer industry advertising intensity measure.<sup>4</sup>

In H<sub>5</sub>, lower prices increase market share and market pioneers tend to charge lower prices. Price has a negative but insignificant (-.25) impact on market share. In the relative price equation, market pioneers charge sig-

<sup>4</sup>Principal components were formed from the measures of pioneer consumer information and pioneer distribution advantages. The simple correlations between these two principal components and the pioneer industry advertising intensity measure are .39 and .28, respectively.

nificantly less,  $-4.40\%$ , than late entrants. Multiplying these two coefficients yields a 1.10 market share point impact.

For this hypothesis, the *ceteris paribus* condition has an important influence on the results in the sense that the model is holding product quality constant. Recall that pioneers are estimated to have a 20.99 product quality point advantage. Because product quality has a positive (.18) and highly significant influence on price, this advantage translates into a 3.78% higher price for pioneers. The product quality impact essentially eliminates the pioneer price reduction of 4.40%. Thus, it is correct that, *ceteris paribus*, pioneers charge lower prices than late entrants but, when product quality also is considered, it is more accurate to state that pioneers have higher quality but do *not* charge correspondingly higher prices.<sup>5</sup>

H<sub>6</sub> states that on the basis of absolute cost advantages, pioneers have direct cost savings. These savings, in turn, lead to a stronger marketing mix and higher market shares. However, pioneers are estimated to have significant absolute cost *disadvantages* (2.22) rather than savings.<sup>6</sup> H<sub>7</sub> posits that because of scale economy advantages, pioneers have direct cost savings which lead to a stronger marketing mix and higher market shares. Higher market shares do lead to significantly lower direct costs ( $-.08$ ). Multiplying the average pioneer share advantage by this market share coefficient provides a 2.08% savings. Total direct cost savings are obtained by adding the 2.08 scale-based savings to the 2.22 absolute cost disadvantage. This calculation yields essentially no difference (.14) in average direct costs. Consequently, on average, there is no indication of significant direct cost savings for pioneers and no support for H<sub>6</sub> and H<sub>7</sub>.

Recall that the testing of pioneer product quality (H<sub>1</sub>), product line breadth (H<sub>2</sub>), and price (H<sub>3</sub>) advantages is based on holding direct costs constant. The total advantage for pioneers in each of these areas equals the advantages estimated in H<sub>1</sub>, H<sub>2</sub>, and H<sub>3</sub> plus any indirect advantage working through direct costs. Because pioneers have essentially the same direct costs as late entrants, this indirect advantage is very small. Thus, we can conclude that the total advantages are similar to the advantages estimated in H<sub>1</sub>, H<sub>2</sub>, and H<sub>3</sub>—i.e., pioneers tend to have overall product quality and product line breadth advantages, while charging essentially the same price as late entrants.

<sup>5</sup>The market share explanatory variable also influences these results, but to a lesser degree than product quality. In Table 4, market share has a significant influence on price (.08). Because these relatively new pioneers have an average 26 share point advantage, this market share influence leads to a 2% price increase. When this is added to the product quality influence, pioneers charge somewhat higher (1.5%) but not significantly higher prices than late entrants.

<sup>6</sup>Potential explanations for this unanticipated result are that (1) in a cross-sectional analysis experience advantages can be biased downward and (2) late entrants in a market may have lower initial costs than the pioneer (Day and Montgomery 1983).

In H<sub>8</sub> we hypothesize that because of consumer information advantages, pioneers have *higher* shares in industries where products have a low purchase price and low purchase frequency and *lower* shares in industries where products are changed on (1) a seasonal or (2) an annual or periodic basis. For the pioneer distribution hypothesis (H<sub>3</sub>), we pointed out that pioneers have higher shares in markets where the product has a low purchase price. Pioneers in markets with low purchase frequency are estimated to gain 5.01 market share points. Pioneers in markets where products are changed on a seasonal basis are estimated to have a 9.10 share point loss, whereas pioneers in markets where products are changed on an annual or periodic basis are estimated to have a 3.78 share point loss. In total, all four coefficients have the hypothesized sign and are statistically significant. These results support H<sub>8</sub>.

H<sub>9</sub> states that a deterioration of pioneer product quality, product line breadth, price, and absolute cost savings over time leads to lower pioneer shares. Pioneers who have been in their market 20 years or more are estimated to have a significant reduction ( $-10.78$ ) in product quality, which leads to a reduction in the share impact from 2.94 to 1.43 share points—i.e., a 10.21 product quality point advantage times .14 equals 1.43 market share points.

Relatively old pioneers are estimated to have a significant reduction ( $-.22$ ) in product line breadth, which reduces the share impact from 8.06 to 5.20 share points. Thus, pioneer product line breadth advantages appear to be both larger and more sustainable than pioneer product quality advantages.

We note that relatively old pioneers do not significantly change their pricing strategy (.46). However, we estimate that relatively old pioneers have significant 2.77% direct cost savings, a finding contradictory to the hypothesized sign. This value when combined with the 2.22% cost disadvantage yields net direct cost savings based on absolute cost savings of .55%. For relatively old pioneers, higher shares which average 12% yield scale-based direct cost savings of .96%. Thus, the total direct cost savings for these pioneers are roughly 1.5%. Though there is some statistical support for these cost savings, the corresponding impact on product quality, product line breadth, price, and market share is relatively small.<sup>7</sup>

To summarize, the results for H<sub>9</sub> indicate pioneer share

<sup>7</sup>The market share advantage is estimated by multiplying the lower direct costs by the estimated influence of costs on product quality, product line breadth, and price, and then multiplying these values by the estimated product quality, product line breadth, and price coefficients in the market share equation.

Here, the total estimated market share impact is 1.94 market share points. Even this estimate may be too high because in a full-information maximum likelihood estimation, the impact of direct cost savings on product quality, product line breadth, and price is much smaller (Robinson 1984).

losses based on reductions in product quality and product line breadth. The results do *not* suggest losses based on changes in pricing strategy or direct costs.

### DISCUSSION

#### *Summary of Theoretical and Empirical Analysis*

Our study examines two basic questions: In consumer goods industries, do market pioneers retain higher market shares over the long term, and if so, why? We find the empirical association between order of entry and market share to be almost as strong as that between market share and ROI. Theory suggests three basic sources of this strong empirical association. First, with relative direct costs held constant, market pioneering can lead to a stronger relative marketing mix, which can produce a high market share. Second, market pioneering can lead to relative direct cost savings, and if a portion of the cost savings is channeled into providing a stronger relative marketing mix, market share can increase. Third, market pioneering can lead to a long-term consumer information advantage, which can also increase market share.

Nine hypotheses are developed and tested on a broad cross section of consumer goods businesses. The results from two-stage and three-stage least squares estimation lead to the same conclusions about the acceptance and rejection of the hypotheses. Pioneers tend to have higher product quality and broader product lines, while charging essentially the same price as late entrants. The evidence indicates that pioneer product quality and product line breadth advantages significantly deteriorate over time.

In convenience goods industries, where pioneers are hypothesized to have distribution advantages, pioneers have higher market shares. In contrast, in industries with intensive advertising, pioneers are found *not* to have significantly higher shares.

The relative consumer information argument is tested across two extreme types of consumer goods industries, one where the advantage for pioneers is assumed to be relatively strong and a second where the advantage is assumed to be relatively weak. Support is provided for the consumer information hypothesis in that pioneers have higher shares in industries where purchase price and purchase frequency are low, and lower shares in industries where all or part of the product line is changed on a regular basis.

For direct costs, relatively old pioneers achieve small savings, whereas relatively new pioneers have essentially no direct cost savings. In practical terms, the direct cost savings for the relatively old pioneers lead to only a small increase in market share.

#### *Limitations and Alternative Explanations*

Certain limitations of the study should be recognized. First, from a theoretical perspective, the static nature of a cross-sectional analysis precludes consideration of important events that occur over time. In our study, two

decades or more typically separate the market pioneering act and the assessment of market share. Thus, valid questions include: Did the pioneer have an adequate lead time in comparison with later entrants? Were adequate resources available to develop the market? Did rapid market growth facilitate competitive entry and reduce pioneer share levels?

In addition, a cross-sectional study can be affected by sample heterogeneity, which can result in misleading conclusions (Bass, Cattin, and Wittink 1978). We address the heterogeneity issue by first limiting the analysis to consumer goods businesses in the maturity stage of the product life cycle. Further, to control for differences across markets, we hypothesize pioneer market shares to differ by the following characteristics: purchase price, purchase frequency, customer service importance, frequency of product change, industry advertising intensity, and time in the market. As already mentioned, the empirical analysis covers only surviving pioneers. Lack of data for unsuccessful pioneers biases absolute market share returns upward, but the hypothesis testing should not be affected because there is no reason to suspect that the *sources* of pioneer advantages are influenced by this data limitation.

Parts of the analysis are limited by a lack of correspondence between theory and data. If the PIMS perceived product quality measure is influenced by consumer information levels, the results for pioneer product quality advantages ( $H_1$ ) could reflect a combination of product quality and consumer information ( $H_8$ ) advantages. This may be an important measurement limitation because Urban and his associates (1983) did *not* find a significant positioning quality advantage for pioneers.

Another measurement limitation is that the hypotheses for the pioneer distribution ( $H_3$ ), advertising ( $H_4$ ), and consumer information ( $H_8$ ) advantages are tested by examining industries where these advantages are hypothesized to be relatively strong and relatively weak. Because specific measures of distribution, advertising, and consumer information are not available, the interpretation of these results is somewhat speculative. Also, for  $H_5$ , it remains unclear why pioneers do not charge higher prices even though they tend to have higher product quality.

Alternative explanations for the strong empirical association between order of entry and market share appear to be less cogent than those advanced in our hypotheses. One such alternative explanation is that the results simply reflect sampling bias associated with the PIMS data. It is well known that the PIMS sample contains businesses which tend to be successful. Consequently, the sample is biased toward including successful pioneers. Recall, however, that pioneers are compared with late entrants, and late entrants in the PIMS sample also tend to be more successful than typical late entrants. Thus, even though absolute market shares are biased upward, relative shares are not necessarily biased in the same way.

Given the consistency of our results with those reported by Urban et al. (1983), it seems unlikely that a PIMS-specific sampling bias is behind the strong empirical association.

Another possible explanation is a systematic difference in skills and resources between pioneers and late entrants. In general, pioneers may be businesses with skills and resources attuned to market leadership, whereas late entrants may be attuned to being market nichers. It should be kept in mind that the advantages of pioneers across different types of industries are generally consistent with the theoretical arguments. If systematic differences in terms of skills and resources were behind the order of entry and market share relationship, these differences would not be expected.

In addition, one could argue that the higher pioneer shares are based on patent protection. This question can be addressed with the PIMS data measure which asks whether or not a business benefits to a significant degree from product patents or trade secrets. In our sample, only 20% of the pioneers benefit to a significant degree from product patents or trade secrets. These pioneers have an average share level of 30% whereas other pioneers have an average share level of 29%. This difference is not statistically significant ( $t = .25$ ).

Overall, the theoretical and empirical evidence presented here suggests that order of market entry is a major determinant of market share for a broad cross section of consumer goods businesses.

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